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CONGRESS OF THE UNITED STATES
CONGRESSIONAL BUDGET OFFICE

AUGUST 1987

# The Economic and Budget Outlook: An Update

## A Report to the Senate and House Committees on the Budget

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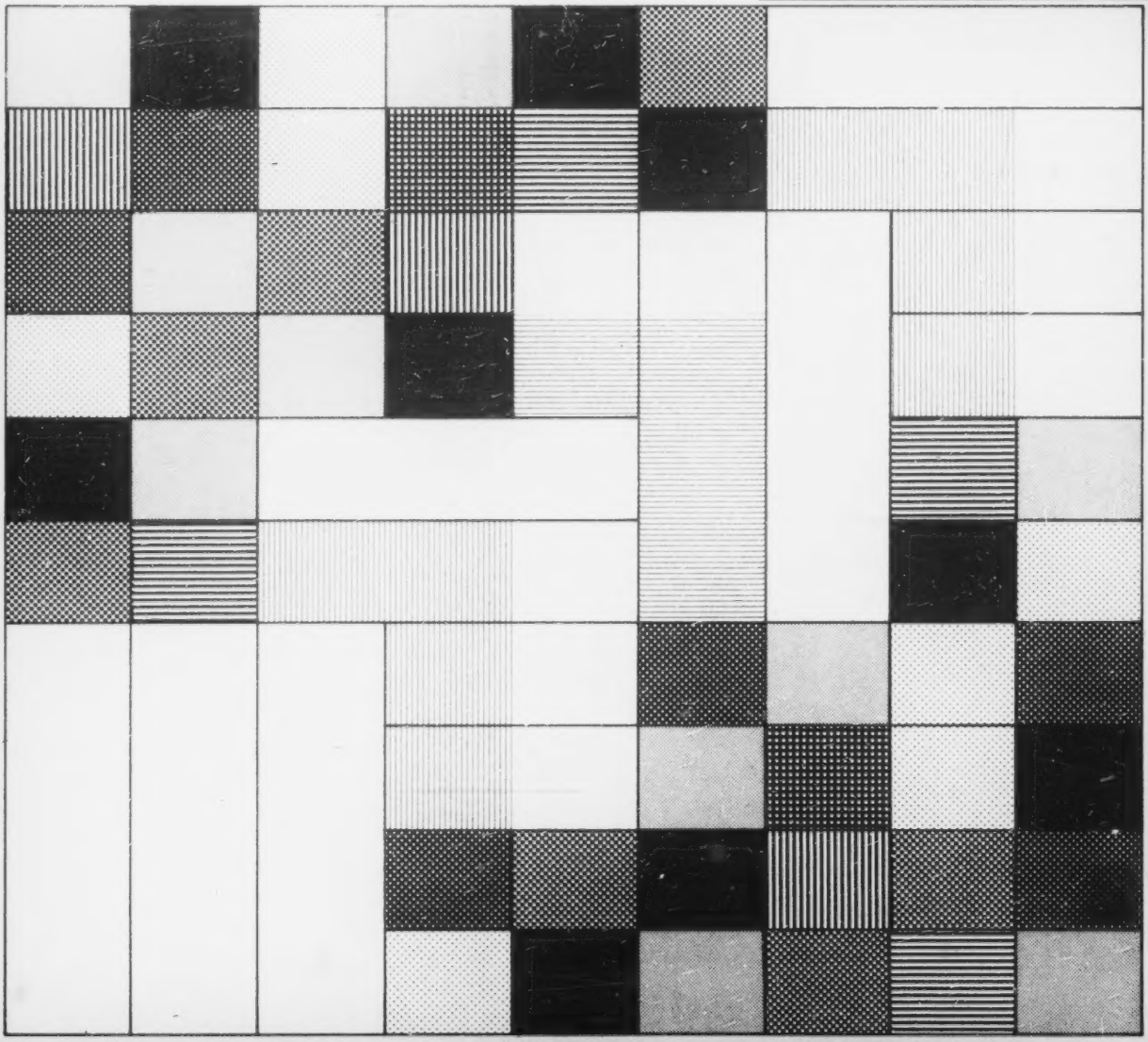

# THE ECONOMIC AND BUDGET OUTLOOK:

# AN UPDATE

The Congress of the United States
Congressional Budget Office

## NOTES

Unless otherwise indicated, all years referred to in this report are calendar years.

Unemployment rates throughout the report are calculated on the basis of the civilian labor force.

Details in the text and tables of this report may not add to totals because of rounding.

Figures showing periods of recession (indicated by a shaded area) reflect the peak (P) and trough (T) of the recession.

The Balanced Budget and Emergency Deficit Control Act of 1985 (popularly known as Gramm-Rudman-Hollings) is also referred to in this volume more briefly as the Balanced Budget Act.

# PREFACE

This volume is one of a series of reports on the state of the economy and the budget issued periodically by the Congressional Budget Office (CBO). Chapter III constitutes the report required by Section 2905(a) of the Deficit Reduction Act of 1984 (Public Law 98-369). In accordance with CBO's mandate to provide objective analysis, the report contains no recommendations.

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## SUMMARY

Moderate economic growth--spurred mainly by an improvement in foreign trade--is likely to continue, according to the latest Congressional Budget Office (CBO) projections. But the growth rate is slightly lower than previously projected. Also, the outlook now shows higher consumer price inflation and interest rates than were foreseen in the winter. This change in economic assumptions has increased the projected budget deficits for 1988 through 1992.

## THE BUDGET SITUATION

While CBO's winter baseline deficit projection declined steadily from $176 billion in 1987 to $84 billion in 1992, the new estimates show a different pattern. Because of unexpectedly strong growth in revenues, the 1987 deficit is now estimated at $157 billion. But the improvement does not persist. The baseline deficit, which assumes a continuation of current budgetary policies, rises to $183 billion in 1988 and $192 billion in 1989 before beginning a slow decline.

This pattern is caused largely by the phase-in of the Tax Reform Act of 1986 and by various one-time outlay reductions, as shown in Summary Table 1 and Summary Figure 1. Tax reform has added about $20 billion to revenues in 1987, but will reduce revenues by $12 billion in 1988 and $18 billion in 1989. Asset sales, loan prepayments, the one-day delay of the military pay date, and other one-time outlay savings reduce the deficit by $15 billion in 1987 but add to the deficit thereafter. Removing these two items yields an adjusted deficit that averages about $170 billion over the next four years. These adjusted deficits decline relative to GNP--from 4.4 percent of GNP in 1987 to 2.5 percent in 1992--but at a slower rate than in the earlier projections.

Summary Table 2 details the changes in the baseline budget projections since CBO's February report. The most significant changes stem from revisions in the economic projections, which are summarized in the next section. Enacted legislation, primarily the supplemental appropriation, has

raised 1987 budget authority and outlays. Because the baseline assumes that appropriations are held constant in real terms, the supplemental appropriation is projected to increase spending in later years as well. Technical reestimates resulting primarily from new data on taxable incomes have raised revenues, while reestimates for farm price supports, deposit insurance, and Social Security benefits have reduced outlays. The new estimates do not include the new thrift savings fund for federal employees in the budget totals, following the recent General Accounting Office opinion about its proper budgetary treatment. As a result, the thrift fund's receipt of voluntary employee contributions is no longer treated as reducing the deficit, and agency contributions add to the deficit.

SUMMARY TABLE 1. EFFECT OF TAX REFORM AND ONE-TIME OUTLAY SAVINGS ON THE DEFICIT (By fiscal year)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|
| | | | **In Billions of Dollars** | | | |
| Baseline Deficit | 157 | 183 | 192 | 176 | 165 | 151 |
| Adjustment for: | | | | | | |
| Tax reform | 20 | -12 | -18 | -5 | 2 | 4 |
| One-time outlay savings a/ | 15 | -2 | -2 | -1 | -1 | -1 |
| Total adjustments | 35 | -14 | -20 | -6 | 1 | 3 |
| Adjusted Deficit | 192 | 169 | 172 | 170 | 166 | 154 |
| | | | **As a Percent of GNP** | | | |
| Baseline Deficit | 3.6 | 3.9 | 3.8 | 3.3 | 2.9 | 2.5 |
| Adjusted Deficit | 4.4 | 3.6 | 3.4 | 3.2 | 2.9 | 2.5 |

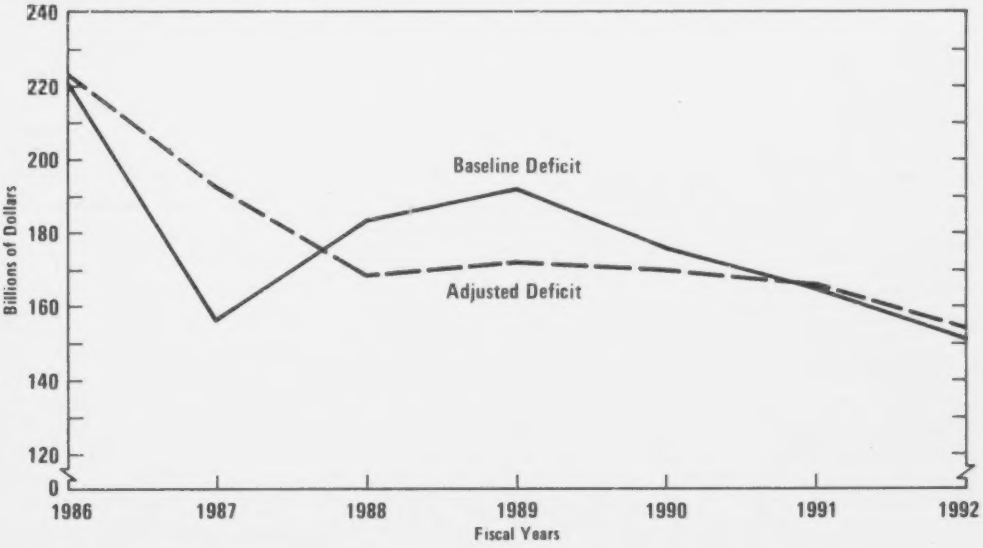
SOURCE: Congressional Budget Office.

a. Includes asset sales, loan prepayments, Outer Continental Shelf escrow releases, military pay delay, Medicare payment delay, and advance of final revenue-sharing payment.

Implementing the policies of the Congressional budget resolution would reduce the deficit by $37 billion in 1988, $52 billion in 1989, and $68 billion in 1990 compared with the CBO baseline (see Summary Table 3). About one-half of the deficit reduction is to come from tax increases. Another 20 percent would result from holding the growth in defense spending below the rate of inflation. Defense outlays would be $2 billion below the baseline in 1988, $12 billion lower in 1989, and $19 billion lower in 1990. The resolution allows even less defense spending if the assumed tax increases are not signed into law.

Of the 1988 savings, $5 billion would result from allowing rural electric cooperatives to prepay to the Treasury without penalty loans that were made to them at the higher interest rates prevailing in the early 1980s. While the transaction would cost the federal government money over the long run, the loan prepayments are treated as reducing the deficit in the year in which the Treasury receives them.

Summary Figure 1.
Deficit Adjusted for Tax Reform Act and One-Time Savings




SOURCE: Congressional Budget Office.

## ECONOMIC PROJECTIONS

The major differences between the revised economic projections and those in CBO's winter report are higher inflation for 1987 and 1988 and higher interest rates and lower economic growth over the 1987-1992 period. Consumer price inflation is higher for two reasons: oil prices rebounded sharply on world markets during the first half of the year, and the dollar fell precipitously against the currencies of most of the major U.S. trading partners. In response to threatened inflation and some tightening by the Federal Reserve, both long- and short-term interest rates ratcheted upward. By mid-year, interest rates on 10-year Treasury bonds had increased more than a percentage point; rates on short-term bills also rose, but to a lesser extent.

SUMMARY TABLE 2. CHANGES IN BASELINE DEFICIT PROJECTIONS SINCE FEBRUARY
(By fiscal year, in billions of dollars)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|
| Winter Baseline | 176 | 171 | 164 | 137 | 110 | 84 |
| Changes | | | | | | |
| Enacted legislation | 3 | 2 | 2 | 2 | 2 | 2 |
| Economic reestimates | 6 | 23 | 35 | 49 | 64 | 77 |
| Technical reestimates | -28 | -16 | -13 | -16 | -15 | -16 |
| Thrift Fund accounting | 1 | 3 | 3 | 3 | 3 | 3 |
| Total | -18 | 12 | 27 | 39 | 55 | 67 |
| Summer Baseline | 157 | 183 | 192 | 176 | 165 | 151 |

SOURCE: Congressional Budget Office.

The Forecast for 1987 and 1988

Further escalation in inflation is not anticipated. Some increase was bound to occur from the temporarily low inflation rate in 1986; energy and farm commodity prices could not continue falling forever. Barring an interruption of Persian Gulf oil, however, oil supplies appear fundamentally to be adequate. The CBO forecast therefore assumes only a gradual increase in

SUMMARY TABLE 3. POLICY CHANGES IN THE FISCAL YEAR 1988 BUDGET RESOLUTION AS ESTIMATED BY CBO
(By fiscal year, in billions of dollars)

| | 1988 | 1989 | 1990 |
|---|---|---|---|
| CBO Baseline Deficit | 183 | 192 | 176 |
| Policy Changes | | | |
| Revenue increases a/ | -21 | -25 | -26 |
| National defense | -2 | -12 | -19 |
| Nondefense discretionary spending | -4 | -6 | -8 |
| Entitlements | -3 | -5 | -7 |
| Offsetting receipts | -1 | b/ | 1 |
| Rural Electrification Administration prepayments | -5 | 1 | 1 |
| Debt service savings | -1 | -5 | -9 |
| Total | -37 | -52 | -68 |
| Budget Resolution Deficit as Estimated by CBO | 146 | 140 | 108 |

SOURCE: Congressional Budget Office.

a. Revenue increases appear as negative numbers because they reduce the deficit.

b. Less than $500 million.

the price of imported oil from about $18.00 per barrel in mid-1987 to about $20.00 per barrel by the end of 1988. Food prices are assumed to rise by about 4½ percent in both 1987 and 1988. In view of the continuing rapid build-up of U.S. debt to foreigners, CBO and most private forecasters expect that downward pressure on the dollar will continue. The forecast assumes that the exchange rate will be about 5 percent lower at the end of 1988 than it is now. All these factors will continue to raise the cost of imported goods and other consumer purchases through the end of 1988. Because of the current amount of slack in the economy, however, they should not touch off a price-wage explosion, such as happened in the 1970s.

The Federal Reserve will nonetheless continue to be concerned that these temporary price increases not become the basis for a renewed inflationary spiral. As a result, the Federal Reserve will try to prevent further sharp depreciations of the dollar and maintain the differential between interest rates in the United States and interest rates abroad. Reflecting a more inflationary environment and a more stringent policy stance by the Federal Reserve, the CBO forecast shows interest rates to be somewhat higher than previously forecast, particularly in 1988.

The short-run forecast for 1987 and 1988 is shown in Summary Table 4. The forecast assumes that the Congressional budget resolution will be fully implemented and that therefore the federal deficit will shrink. Real GNP is expected to grow moderately--by 3.1 percent in 1987 and 2.6 percent in 1988 (fourth quarter to fourth quarter). The growth forecast for 1987 is virtually unchanged from the winter, but the figure for 1988 has been lowered slightly in view of the worsened outlook for inflation and interest rates. The higher inflation will slow the growth in real disposable personal income and consumption, while higher interest rates will dampen investment, especially in residential construction. With domestic demand sluggish, an improvement in the trade balance--fueled by the continuing decline in the dollar--must provide the major impetus to growth.

## Economic Projections for 1989-1992

The medium-term economic projections are presented in Summary Figure 2 and Summary Table 5. Beyond 1988 these economic assumptions are projections rather than forecasts in that they are based on historical trends. They are simply used to show the budgetary outlook under this average historical experience.

Real GNP is assumed to grow at an average annual rate of about 2.7 percent during the 1989-1992 period--slightly lower than previously projected. The civilian unemployment rate edges down from 6.1 percent in 1988 to 5.7 percent in 1992. Inflation eases somewhat after 1988. The rate of increase in the CPI-W falls by almost a percentage point by 1992. Reflecting the unwinding of inflation, interest rates also drop. By the end of the period, the three-month Treasury bill rate averages 5.7 percent, and the 10-year government bond rate 6.8 percent.

## Uncertainties in the Forecast

A number of factors make the forecast uncertain. In the short term, the future paths of consumption, net exports, import prices, and inflation are particularly difficult to predict. In the long run, interest rates and produc-

SUMMARY TABLE 4. THE CBO FORECAST FOR 1987 AND 1988

| | Actual | | Forecast | |
|---|---|---|---|---|
| | 1985 | 1986 | 1987 | 1988 |
| **Fourth Quarter to Fourth Quarter (percent change)** | | | | |
| Nominal GNP | 6.6 | 4.5 | 7.2 | 6.8 |
| Real GNP | 3.3 | 2.2 | 3.1 | 2.6 |
| Implicit GNP Deflator | 3.2 | 2.2 | 4.0 | 4.2 |
| CPI-W a/ | 3.3 | 0.9 | 5.1 | 5.2 |
| **Calendar-Year Averages (percent)** | | | | |
| Unemployment Rate | 7.2 | 7.0 | 6.3 | 6.1 |
| Three-Month Treasury Bill Rate | 7.5 | 6.0 | 5.9 | 6.6 |
| Ten-Year Government Bond Rate | 10.6 | 7.7 | 8.1 | 8.5 |

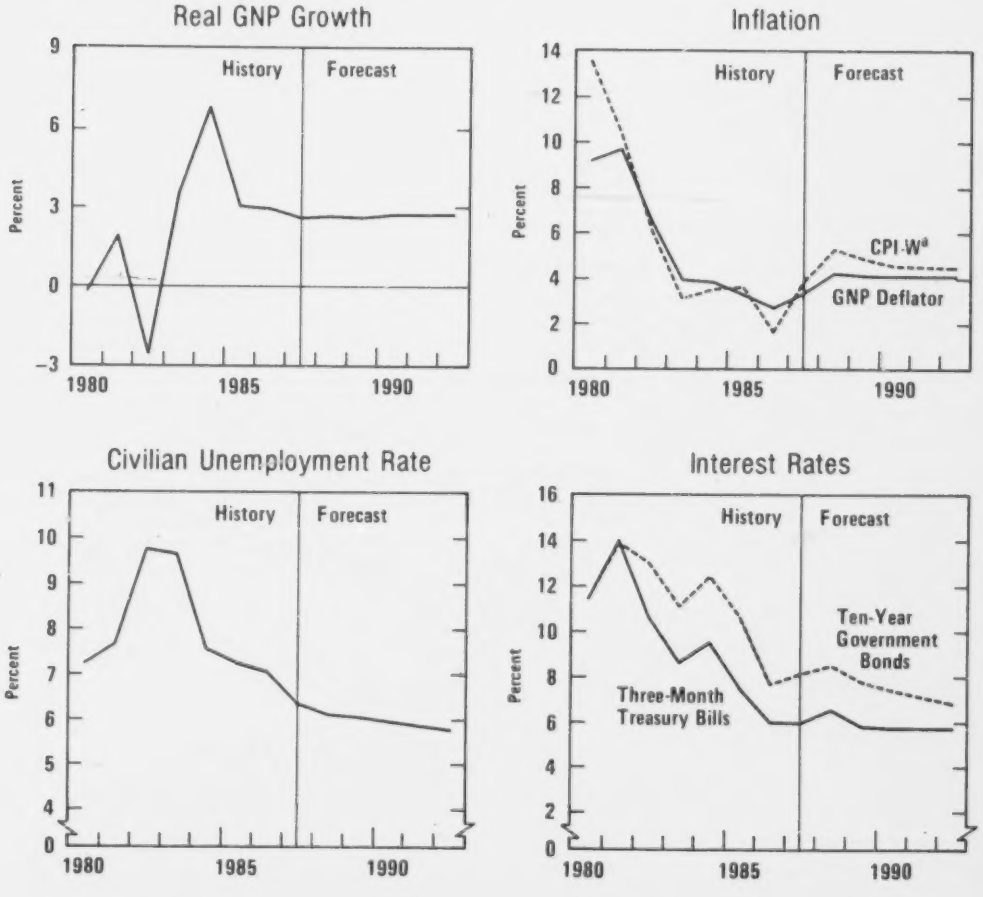
SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis; Department of Labor, Bureau of Labor Statistics.

a. Consumer Price Index for urban wage earners and clerical workers.

tivity are particularly important; minor variations in either variable can change the budget projections significantly.

These and other uncertainties imply that actual budget deficits typically will differ from the forecasts. Indeed, over the 1980s actual deficits have been significantly larger than those forecast at the time of the first Congressional budget resolution--in part because of policy changes, in part because of estimation biases and uncertainties. The last chapter of this report provides a special analysis of these errors.

Summary Figure 2.
## Major Economic Assumptions




SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis; Department of Labor, Bureau of Labor Statistics; Federal Reserve Board.

[a]Consumer Price Index for all urban wage and clerical workers.

SUMMARY TABLE 5. COMPARISON OF CBO WINTER AND SUMMER ECONOMIC PROJECTIONS (By calendar year)

| | Actual | Forecast | | Projected | | | |
|---|---|---|---|---|---|---|---|
| | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
| Nominal GNP Growth (percent change) | | | | | | | |
| Summer | 5.6 | 5.9 | 6.9 | 6.7 | 6.8 | 6.8 | 6.8 |
| Winter | 5.4 | 6.0 | 6.9 | 7.2 | 7.4 | 7.0 | 6.8 |
| Implicit GNP Deflator (percent change) | | | | | | | |
| Summer | 2.6 | 3.3 | 4.1 | 4.0 | 4.0 | 4.0 | 4.0 |
| Winter | 2.8 | 3.2 | 3.8 | 4.1 | 4.2 | 4.2 | 4.2 |
| Real GNP Growth (percent change) | | | | | | | |
| Summer | 2.9 | 2.6 | 2.7 | 2.6 | 2.7 | 2.7 | 2.7 |
| Winter | 2.6 | 2.8 | 3.0 | 3.0 | 3.1 | 2.7 | 2.5 |
| CPI-W (percent change) a/ | | | | | | | |
| Summer | 1.6 | 3.8 | 5.2 | 4.8 | 4.4 | 4.4 | 4.4 |
| Winter | 1.6 | 3.5 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 |
| Unemployment Rate (percent) | | | | | | | |
| Summer | 7.0 | 6.3 | 6.1 | 6.0 | 5.9 | 5.8 | 5.7 |
| Winter | 7.0 | 6.6 | 6.5 | 6.3 | 6.1 | 6.0 | 6.0 |
| Three-Month Treasury Bill Rate (percent) | | | | | | | |
| Summer | 6.0 | 5.9 | 6.6 | 5.8 | 5.7 | 5.7 | 5.7 |
| Winter | 6.0 | 5.6 | 5.7 | 5.6 | 5.5 | 5.3 | 5.2 |
| Ten-Year Government Bond Rate (percent) | | | | | | | |
| Summer | 7.7 | 8.1 | 8.5 | 7.8 | 7.4 | 7.1 | 6.8 |
| Winter | 7.7 | 7.2 | 7.2 | 6.6 | 6.2 | 5.9 | 5.6 |

SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis; Department of Labor, Bureau of Labor Statistics.

a. Consumer Price Index for urban wage earners and clerical workers.

CHAPTER I

# THE ECONOMIC OUTLOOK

The pace of economic activity picked up in the first half of 1987, but it is unlikely that this rate of growth will continue in the near term. Output and employment grew at a faster rate than in 1986, and the unemployment rate decreased substantially, falling to its lowest level since 1979. Though the real foreign trade balance has improved, and should continue to be a strong source of growth, most other components of demand are weakening. In contrast to last year, when falling interest rates and inflation were stimulating the economy at the same time as the growing trade deficit was restraining growth, interest rates and inflation are now likely to be dampening factors while the improvement in net exports is likely to be the strongest source of growth. In addition, the continued effort to reduce the federal budget deficit will tend to restrain growth in government outlays.

Only moderate growth and almost no change in the unemployment rate are forecast for the next 18 months. Inflation as measured by the Consumer Price Index (CPI) is expected to increase from its low 1986 rate, because of the increase in petroleum prices and an acceleration in import prices.

The midsummer outlook differs from that in the January report in forecasting higher inflation and interest rates in the near term, and slightly lower real economic growth throughout the 1988-1992 period. The primary reasons for the upward revision in consumer price inflation are the fall in the dollar early this year, which was larger than anticipated, and the recent increase in oil prices. The revision in interest rates largely reflects the increase that has already taken place. Some additional upward revision results from higher current and expected inflation and from the Federal Reserve Board's announced intention to counter further sharp declines in the dollar.

The reduction in the real GNP growth forecast for 1988 reflects higher interest rates and the adverse effect of higher inflation on household real incomes. The marginal reduction in the growth assumptions after 1988 arises from a reappraisal of the long-run growth prospects of the economy.

## FISCAL POLICY

After several years of stimulus, fiscal policy is tightening in 1987, and it should continue to tighten if the Congressional Budget Resolution for 1988 is adopted, as assumed in the economic forecast. In the long run, smaller deficits should help to improve national saving, domestic investment, and the foreign trade balance. In the short run, however, fiscal restraint may tend to slow the growth in output and employment.

The federal deficit is expected to decline from $221 billion in fiscal year 1986 to $157 billion in 1987. Based on the tax and spending policies of the budget resolution and the economic outlook discussed in this report, the deficit is expected to decline further to $146 billion in 1988 and to $108 billion by 1990. On average, about half of the 1988-1990 deficit reductions embodied in the Budget Resolution reflect measures to limit spending growth, while the rest stem from as yet unspecified revenue increases. Despite the decline in the size of the federal deficit under the budget resolution, the projected ratio of federal debt to GNP does not begin to decline until 1990.

To provide a better measure of discretionary fiscal policy, deficit figures have also been calculated on the basis of nominal potential GNP, which removes cyclical influences. Such standardized-employment deficit estimates, presented in Table I-1 and Figure I-1, show a sharp decline from a postwar high of 4.3 percent of potential nominal GNP in 1986 to 2.7 percent in 1987, followed by a smaller decline to 2.4 percent in 1988. 1/

A number of special factors, however, affect the reported revenue and outlay totals in a manner that distorts the pattern of fiscal restraint from 1986 to 1988. For example, asset sales (which should be excluded from the standardized-employment deficit because such financial transactions have little effect on the economy) vary from year to year (see Table II-7). In addition, the large bulge in capital gains tax revenues this year is a nonrecurring event attributable to a change in the tax law. 2/ The shift of certain federal payments by a few days, from 1987 to 1988, also creates a misleading year-to-year pattern of deficits. When the projected outlays and revenues are adjusted for asset sales, all the budgetary effects of tax

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1. The calculation of potential real GNP is described in Appendix B. Nominal potential GNP is real potential GNP multiplied by the projected GNP deflator.

2. The Tax Reform Act of 1986 repealed preferential tax treatment of capital gains in 1987 and subsequent years. This change encouraged the sale of appreciated assets in 1986 and resulted in additional Treasury receipts in 1987.

TABLE I-1. MEASURES OF FISCAL POLICY
(By fiscal year, on a unified budget basis)

| Standardized-Employment Deficit | Actual 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|---|
| | | | In Billions of Dollars | | | | |
| Budget resolution | 185 | 122 | 117 | 113 | 85 | n.a. | n.a. |
| Adjusted for tax reform and other special factors a/ | 187 | 156 | 98 | 94 | 80 | n.a. | n.a. |
| Baseline | 185 | 122 | 155 | 166 | 154 | 147 | 139 |
| Adjusted for tax reform and other special factors a/ | 187 | 156 | 141 | 146 | 148 | 148 | 142 |
| | | | In Percent of Potential GNP | | | | |
| Budget resolution | 4.3 | 2.7 | 2.4 | 2.2 | 1.6 | n.a. | n.a. |
| Adjusted for tax reform and other special factors a/ | 4.4 | 3.5 | 2.0 | 1.8 | 1.5 | n.a. | n.a. |
| Baseline | 4.3 | 2.7 | 3.2 | 3.2 | 2.8 | 2.5 | 2.2 |
| Adjusted for tax reform and other special factors a/ | 4.4 | 3.5 | 2.9 | 2.9 | 2.7 | 2.6 | 2.3 |

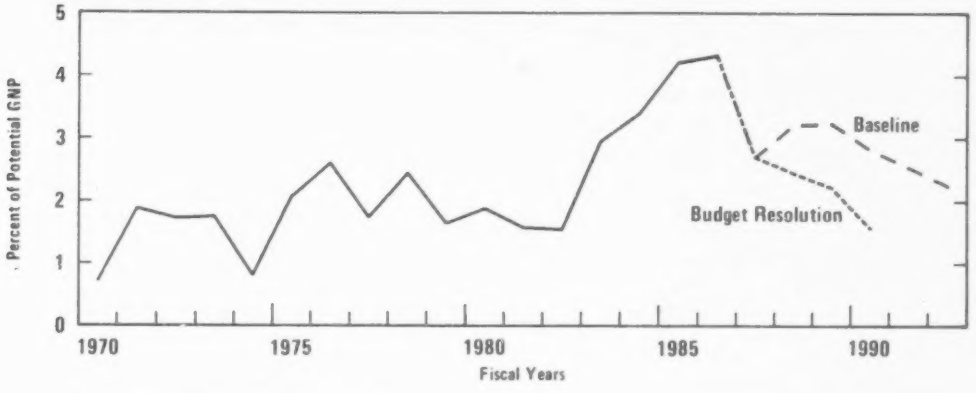
SOURCE: Congressional Budget Office.
NOTE: n.a. = not applicable.

a. Special factors include asset sales, loan prepayments, the accelerated release of Outer Continental Shelf escrow funds, the military pay-date delay, the Medicare payment delay, and the advancement of the final revenue-sharing payment.

reform, and the shifting of payments, the pattern of fiscal policy looks quite different (see Table I-1). 3/ In particular, after making these adjustments,

3. While the Tax Reform Act increases revenues in some years and reduces them in others, it is expected to be approximately revenue neutral in the long run. The adjustment made in Table I-1 removes those year-to-year fluctuations.

Figure I-1.
Standardized-Employment Deficit




SOURCE: Congressional Budget Office.

fiscal policy under the budget resolution shows steadily increasing restraint between 1986 and 1988.

The standardized-employment deficit is projected to decline to 1.6 percent of nominal potential GNP by 1990, assuming continuation of the tax and spending policies of the Budget Resolution for 1988. 4/ This amount represents substantially less restraint than would be realized under the targets of the Balanced Budget and Emergency Deficit Control Act of 1985 (popularly known as the Gramm-Rudman-Hollings targets), which would lower the standardized-employment deficit to 1.7 percent of potential GNP in 1988, and to 0.3 percent in 1990. On the other hand, the policies of the budget resolution result in more restraint than would occur under the baseline policy path (see Table I-1 and Chapter II).

As previous CBO reports have indicated, there is widespread agreement that in the long run smaller federal deficits would be conducive to the formation of private domestic wealth and to higher future living standards. Views differ widely, however, as to the short-run effect of fiscal restraint. Some analysts argue that fiscal restraint could reduce output and employment significantly; others claim that it would have little if any effect. One of the considerations stressed in earlier reports has been that in a world of

4. The projected path of yearly restraint is essentially the same when interest payments and Federal Reserve earnings are excluded from the calculations.

flexible exchange rates the adverse effects of fiscal restraint on output and employment would be diminished by the resulting dollar depreciation and the subsequent improvement of the trade balance. At present, however, monetary policy is apparently aimed at preventing a too rapid decline in the dollar; therefore, this offset to fiscal restraint may be less significant.

The net effect of the Tax Reform Act of 1986 on economic growth over the next 18 months is uncertain. The act, an extensive revision of the tax code, is likely to have a positive long-run impact on economic efficiency. It is difficult to determine, however, what the overall effect on aggregate demand in the short run will be because some aspects of the legislation are favorable to short-run demand while others will temporarily restrain growth. For example, the new tax provisions increased the cost of capital for business fixed investment and multifamily housing, but they also strengthened disposable personal income. Investment, particularly investment in business and certain types of residential structures, is likely to be adversely affected, but the reduction in personal income taxes will tend to keep consumption from slowing as much as it would have in the absence of tax reform. 5/ The act's overall impact is therefore assumed to be essentially neutral in this forecast.

## THE DOLLAR, MONETARY POLICY, AND INTEREST RATES

Monetary policy and developments in financial markets were closely linked to the behavior of the dollar in the first half of 1987. The drop in the dollar was a major factor in the sudden jump in interest rates, and the extent of the dollar's fall encouraged the Federal Reserve Board to become less accommodative in its monetary policy. This stance is likely to continue as the Board attempts to keep the dollar from falling too rapidly, and consequently some upward pressure on interest rates is probable in the short run.

Monetary Policy Background. In 1986, the Federal Reserve pursued a monetary policy it characterized as "accommodative." 6/ The various monetary

5. See Congressional Budget Office, "Economic Impacts of the Tax Reform Act of 1986: Short-Run and Long-Run Perspectives" (Staff Working Paper, June 1987).

6. See the statement by Paul A. Volcker, Chairman, Board of Governors of the Federal Reserve System, before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, February 19, 1987, *Federal Reserve Bulletin*, vol. 73 (April 1987), pp. 282-289.

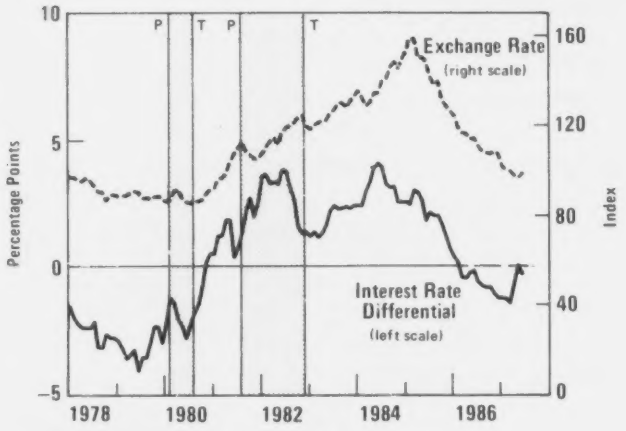
aggregates, especially M1, grew at a relatively rapid pace, and the discount rate was reduced four times by a total of two percentage points--roughly in line with reductions in market interest rates. Market rates of interest continued to decline into early 1987, reaching their lowest levels in nearly a decade. In addition, nonborrowed reserves held by depository institutions grew dramatically throughout 1986, increasing at a rate of about 25 percent. The generous provision of reserves and the expansion in money occurred, however, in an environment of restrained economic growth and declining inflationary pressures.

The velocity of M1 (that is, the ratio of nominal GNP to the M1 monetary aggregate) declined much more in 1986 than expected, continuing the relative unpredictability of the relationship in the 1980s. On the basis of historical relationships before 1980, the rapid growth of the monetary aggregates that occurred in 1986 should generate higher inflation this year. But the recent experience with changes in velocity suggests that monetary growth rates are for the time being poor predictors of inflation. In any event, the Federal Reserve allowed the growth of all monetary aggregates to slow in the first half of this year.

Private Capital Flows and the Dollar. The decline in the real value of the dollar against the currencies of major industrial countries in 1986, and against the currencies of both the major industrialized countries and the newly industrialized countries early in 1987, indirectly reflected the unwinding of a number of macroeconomic conditions that had earlier resulted in a very strong dollar. These conditions, which were discussed at length in previous CBO reports, resulted in high real rates of return on dollar-denominated assets relative to returns abroad in the first half of the 1980s, caused large net private capital inflows to the United States, and drove up the value of the dollar (see Figure I-2). In real (inflation-adjusted) foreign currency terms, claims against U.S. residents by private foreign residents grew at an average rate of 20 percent per year from the end of 1979 to the end of 1985, whereas similarly calculated claims of U.S. residents against private foreign residents grew less than half as fast. The resulting pace of accumulation of net claims against the United States was clearly unsustainable in the long run, simply because it would have required dollar-denominated assets to comprise a rapidly growing and ever-increasing share of private foreign portfolios.

The easing of U.S. monetary policy in 1986, coupled with moderate economic growth and the prospect of lower federal deficits, resulted in reductions in U.S. interest rates relative to foreign rates. This reduction was a major reason why private net capital inflows slowed considerably in 1986 (though the inflows were still large compared with the 1970s). The downward pressure on the dollar resulting from this slowdown was partly offset

Figure I-2.
## The Exchange Rate and Relative Interest Rates




SOURCES: Congressional Budget Office; Federal Reserve Board; International Monetary Fund.

NOTE: The exchange rate is a trade-weighted average of dollar exchange rates. The real interest-rate differential is the difference between long-term real interest rates for the United States and a GDP-weighted average for other major industrial countries. Long-term real interest rates are long-term nominal interest rates (on government bonds), adjusted for expected inflation rates. Expected inflation is proxied by a two-year centered moving average of actual and projected CPI inflation rates.

by large-scale foreign official intervention during that year. Foreign central banks greatly increased their holdings of dollar assets. In the first quarter of 1987, net private demand for dollar-denominated assets probably slowed a great deal more. 7/

Recent Developments in Interest Rates and Monetary Policy. The Federal Open Markets Committee (FOMC) did not specify a target range for M1 for 1987. It was still concerned, however, about the prospect of future inflation in light of the rapid pace of money expansion in 1986, and felt that some slowdown in money growth was necessary in 1987. This concern was evident in the slightly lower ranges that the FOMC set for M2 and M3 for 1987.

Massive intervention by central banks in foreign exchange markets early this year was ineffective in stopping the decline of the dollar. Moreover, in response to both an increased concern about the inflationary effect of further depreciation and relatively high rates of inflation in the first few months of the year, interest rates rose sharply in the second quarter to levels higher than they had been in over a year. Although the rise in rates occurred across the whole spectrum of maturities, it was much more pronounced for long-term securities (see Figure I-3). The steepening of the

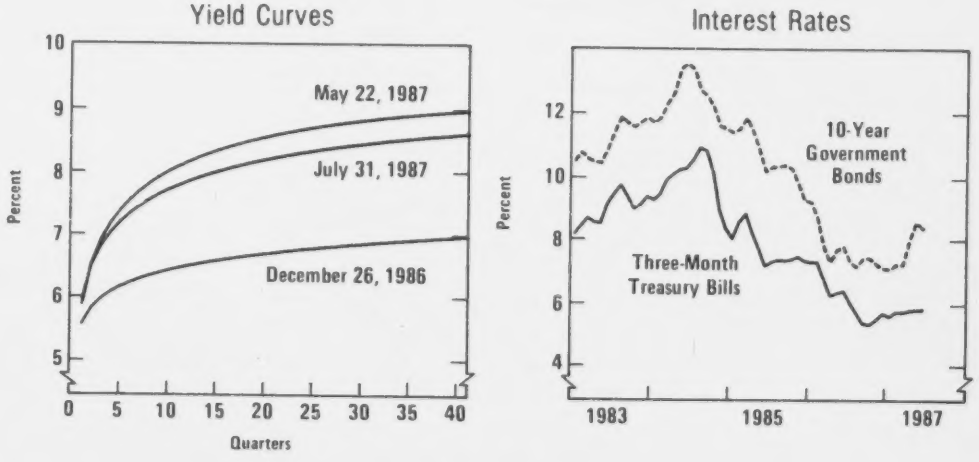
7. Reported net private capital inflows to the United States rose slightly in the first quarter, but this increase was probably the result of temporary factors that did not reflect the underlying private demand for dollar-denominated assets.

term structure of interest rates (that is, long-term rates increasing more than short-term rates) is consistent with expectations that inflation will increase.

The sharp drop in the value of the dollar early in 1987 and the prospects of higher inflation apparently forced the Federal Reserve into a slightly less accommodating monetary policy. There were a number of indications of a slight tightening. First, the spread between the federal funds rate (the rate banks charge one another to lend reserves overnight) and the discount rate increased, suggesting some willingness by the Federal Reserve to allow reserves markets to tighten. Second, the amount of borrowing by depository institutions from the Federal Reserve increased. Third, the broader monetary aggregates M2 and M3 have grown slowly since January and remain at levels below the lower bound of the target-growth ranges established this year by the FOMC (see Figure I-4).

The tightening of monetary policy in the second quarter of 1987 helped to assure investors, foreign and domestic, that the Federal Reserve is willing to act to protect the dollar and resist inflation. The result was a rekindling of demand for dollar-denominated assets and a strengthening of the dollar, at least temporarily.

Figure I-3.
## Recent Movements of Short- and Long-Term Interest Rates



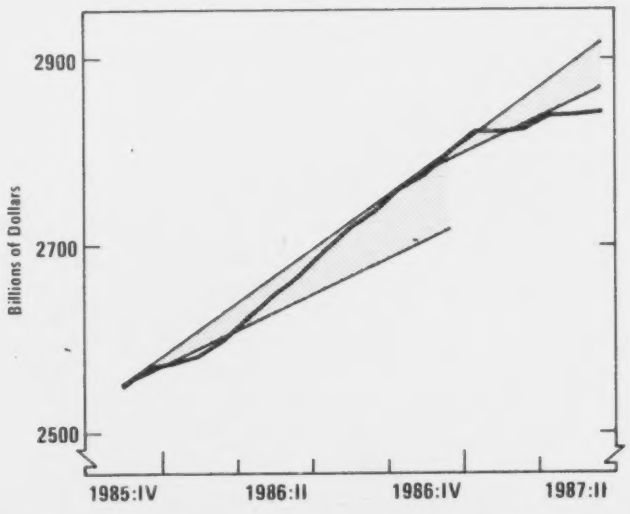

SOURCES: Congressional Budget Office; Federal Reserve Board.

[a]These curves were fitted to weekly average yields on Treasury instruments using a logarithmic function described by Bradley and Crane in the *Journal of Bank Research*, Spring, 1973.

Outlook for the Dollar and Interest Rates. The forecast and medium-term projection both assume that, as implied in the budget resolution, there will be further progress in reducing federal budget deficits relative to GNP. This improvement would allow a gradual reduction of U.S. interest rates relative to those of other major countries. Private residents of the rest of the world are assumed to respond by reducing the rate of accumulation of their net claims against the United States (when measured in real foreign-currency terms) from the 1986 rate to a pace nearer the growth rate of real foreign GNP by 1992. Changes in official net claims against the United States are assumed to be minor after 1988. The gradual transition in the rate of accumulation of dollar-denominated assets by private foreigners would require, according to CBO estimates, a trend rate of dollar depreciation against major foreign currencies of about 5 percent per year through the projection period. Even with the assumed reduction in the rate of foreign accumulation of dollars, total U.S. net foreign liabilities will be growing substantially throughout the projection period, because the current account deficit will continue to grow in nominal terms.

The long-run trend of the dollar assumed in the forecast and projections is only one of many possibilities. Exchange rates depend on the relative demand for capital, and each country's net capital demand depends in turn on private and government saving behavior, investment opportunities, international competitiveness, and so on. For example, if public debt

Figure I-4.
M2 Growth and Targets




SOURCES: Congressional Budget Office; Federal Reserve Board.

NOTE: Shaded areas indicate target ranges. The range was 6% to 9% in 1986, and is 5½% to 8½% in 1987.

in foreign industrial countries were to grow as rapidly in the projection period as it did in the 1970s, less foreign capital would be available for dollar-denominated investment. Some analysts assume that long-run portfolio-balancing objectives require that the U.S. current account be roughly balanced in nominal terms by the early or middle 1990s. 8/ If this is the case, a faster trend rate of dollar depreciation than that incorporated in the projections would be necessary.

Although a smooth trend rate of dollar decline is incorporated in the forecast and projections for 1988 to 1992, the actual path is more likely to be irregular, and the dollar could possibly strengthen for a time. Regardless of the actual path, financial markets and Federal Reserve policy will continue to be affected by fluctuations in the dollar. Anticipated tightness of monetary policy through the end of 1987 should put upward pressure on interest rates in the near term. The duration of such a policy, however, will depend primarily on the strength and durability of the economy's growth. Another factor that could affect Federal Reserve policy is the condition of banks and thrifts. Although strains have eased recently, a large number of financial institutions are still extremely weak (see Box I-1). Fear of a sudden worsening of difficulties may constrain Federal Reserve policy.

## LABOR MARKETS

Productivity has been growing at a snail's pace during the last four quarters, but job creation has been strong. The unemployment rate fell by seven-tenths of a percentage point in the first seven months of the year, both because of gains in employment and because of a slowdown in the growth of the labor force. This sharp decline has raised concerns about tightness in the labor market, but wage increases have continued to be moderate and other indicators imply that there is still slack in the economy.

On the whole, productivity growth continues to be disappointing. Nonfarm business productivity--output per unit of labor--was virtually the same in the second quarter of 1987 as in the second quarter of 1986 (see Figure I-5). In other words, the growth in hours worked (2.6 percent) was roughly equal to the growth in output (2.9 percent).

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8. Rudiger Dornbusch, "Why the Dollar Must Fall Another 30 Percent," *The New York Times* (May 10, 1987), and Paul R. Krugman and George N. Hatsopoulos, "The Problem of U.S. Competitiveness in Manufacturing," *New England Economic Review* (January-February 1987).

## BOX I-1
## TROUBLED FINANCIAL INSTITUTIONS

A significant percentage of the country's federally insured thrift institutions are in trouble. At the end of 1986, the 3,220 federally insured thrifts had $1,165 billion in assets. As a group these thrifts have been solvent and profitable; their net worth has recently been increasing faster than their liabilities. But 327 thrifts, with $88 billion in assets at year-end, had negative net worth and were losing money. Many of these as well as other troubled S&Ls should be closed, and closing them usually involves cash outlays by the Federal Savings and Loan Insurance Corporation (FSLIC). The FSLIC is currently in financial difficulties--with a negative net worth of more than $6 billion, according to the General Accounting Office.

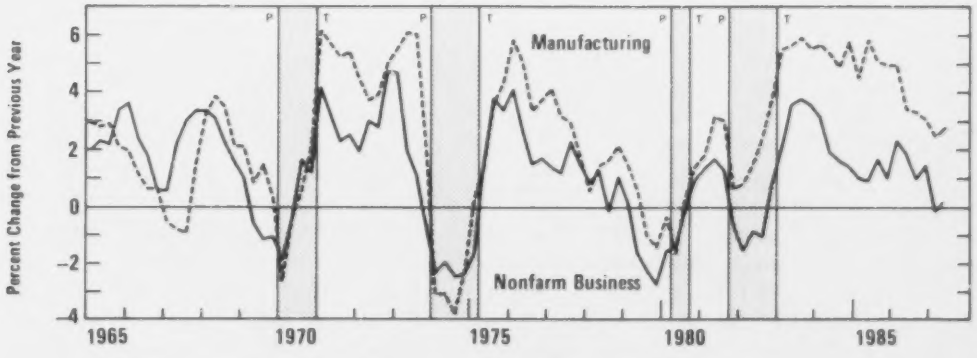
To remedy this situation, the Congress has passed legislation that will enable the FSLIC to be recapitalized in the amount of $10.8 billion. The cost to the FSLIC of closing 50 thrifts in 1986 exceeded 20 percent of the institutions' total assets. Because of this some analysts estimate that the amount needed to deal with all the currently insolvent but still operating institutions is at least $21 billion. Moreover, the profits of the healthy institutions may be insufficient to pay the whole cost of recapitalizing the FSLIC, as is currently being contemplated. Insolvent institutions now have an incentive to invest in risky assets, since if the investments pay off they may become solvent, while if they do not--which is more likely--the resulting losses will be borne by the FSLIC. It is therefore important to close insolvent institutions in a timely manner. In any event, the question is not whether insured depositors will be protected from loss but who will pay for resolving the problem.

The commercial banking sector also has some troubled institutions, particularly among those that had loaned heavily in the farm, energy, and international areas. For a number of reasons, the problems in this sector appear to be far less costly and much more manageable than those of the thrifts. First, the most seriously troubled institutions have been the agricultural or farm banks, which are large in number but account for a very small percentage of all commercial bank assets. Second, the recent rise in energy prices has lessened the problems of banks with substantial portions of their loan assets in energy and energy-related activities. Third, banks that are heavily involved in loans to developing countries have recently been increasing their loan-loss reserves, apparently preparing themselves for future write-downs of bad loans. Finally, the commercial banking industry comprises more than 14,000 institutions with nearly $3 trillion in assets. Compared with the thrifts, relatively few banks are in difficulty and the cost of dealing with them is much less. Moreover, unlike the FSLIC, the Federal Deposit Insurance Corporation (FDIC), which insures deposits at banks, is solvent--with more than $18 billion available to close the insolvent banks.

The aggregate productivity data mask the difference between the productivity performance in manufacturing and in the service-producing sector. Productivity growth in manufacturing, which is crucial for maintaining competitiveness in international trade, has been relatively good in the 1980s compared with the historical record. It compares well with the growth experienced in the 12 other countries that are tracked by the Bureau of Labor Statistics (BLS); in 1986, U.S. manufacturing productivity growth ranked first for the first time since BLS began compiling the data in 1950. In the service-producing sector, on the other hand, productivity growth--as currently measured--virtually ceased in the early 1970s. The measurement of productivity in the service-producing industries is not fully satisfactory, and productivity in that sector--and the economy as a whole--may be understated. But there is little reason to doubt that productivity growth in the service sector has slowed in the past 15 years.

The slow aggregate growth in productivity in the last year was accompanied by strong job growth. Nonfarm payroll employment has grown by 2.5 percent over the last 12 months, with the growth concentrated in the service-producing industries. Though employment in goods-producing industries grew quickly in the first two years of the recovery, it has been relatively stagnant since early 1985. Reflecting the growing trade deficit, manufacturing employment declined by about 100,000 jobs from late 1985 to mid-1986, and employment in oil drilling and exploration plummeted follow-

Figure I-5.
## Productivity Growth




SOURCES: Congressional Budget Office; Department of Labor, Bureau of Labor Statistics.

ing the drop in oil prices in 1985 and 1986. Since mid-1986, however, manufacturing payrolls have begun to increase slowly (see Figure I-6). In addition, with the recovery in oil prices, employment in energy-producing industries seems to have bottomed out.

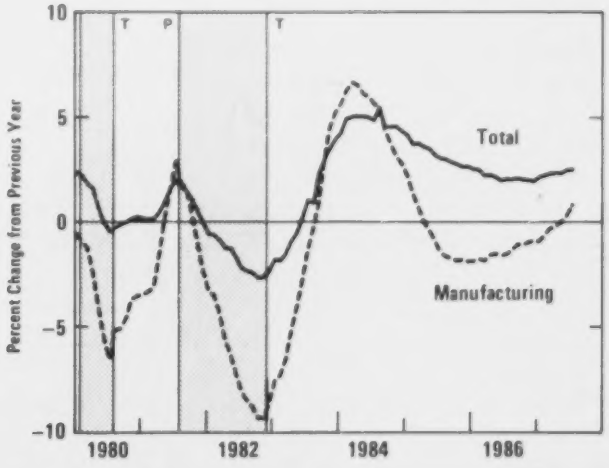
The labor force grew by 1.6 percent over the last 12 months, in part because of continued increases in the labor force participation rate of adult women. A slowing of labor force growth since February, however, accounts for some of the substantial decline in the unemployment rate during the first half of 1987.

The civilian unemployment rate fell from 6.7 percent in December to 6.0 percent in July. The decline has caused some analysts to worry about possible tightness in labor markets and consequent inflationary pressure (see Box I-2). In the 1970s, that level of unemployment might have been considered inflationary, but currently there seem to be few signs of labor market tightness.

## PRICES AND WAGES

Consumer price inflation has increased sharply from the 1.1 percent rate that occurred between December 1985 and December 1986. In the first six months of 1987, prices rose at about a 5½ percent annual rate, though prices excluding food, energy, and used cars remained close to the 4 percent to 4½

Figure I-6.
Private Nonfarm Employment




SOURCES: Congressional Budget Office; Department of Labor, Bureau of Labor Statistics.

NOTE: Establishment survey data.

## BOX I-2
## LABOR MARKETS, INFLATION, AND NAIRU

Before the recent drop in the unemployment rate, most economists (including those at CBO) argued that labor market tightness would not be a concern unless the unemployment rate fell to about 6 percent. It now appears that the figure should be revised downward, because there is no convincing evidence that the degree of slack in productive capacity has dropped commensurately with the unemployment rate. The overall manufacturing capacity utilization rate is below the level normally associated with supply constraints, and wage pressures still appear to be moderate.

Although the relationship between the aggregate unemployment rate and inflationary pressures is complex, economists have made rough estimates of the unemployment rate that are likely to be consistent with a stable rate of inflation. This rate, referred to in the January CBO economic report as the stable inflation rate of unemployment, is frequently called NAIRU (for non-accelerating inflation rate of unemployment). NAIRU can vary from year to year as the underlying relationship between the unemployment rate and inflation changes, and numerous factors could affect that relationship.

Changes in some of these factors now seem to justify a reappraisal of the estimate of NAIRU. Among the most important are demographic changes. For a variety of reasons, different groups in the labor force tend to experience different unemployment rates. If a group such as teenagers--who typically exhibit relatively high unemployment rates--grows relative to the labor force as a whole, inflationary pressures will tend to develop at a higher level of aggregate unemployment than if its share in the labor force is stable or falling.

percent rate that has prevailed for the past three years (see Figure I-7). In large part, the increase in overall consumer inflation was attributable to sharply higher energy prices, reflecting the increase in world oil prices. The decline in the exchange rate in the first quarter was probably not a major factor, since relatively little acceleration in nonpetroleum import prices has yet been reported. In the near future, however, those prices are expected to increase sharply, so that even if energy prices stabilize, higher import prices will push up consumer prices.

This recent higher trend in consumer price increases is expected to continue at least through 1988, as the effect of the recent decline in the dollar works its way through to import prices and consumer prices. As a result, inflation as measured by the Consumer Price Index (CPI) is expected to exceed substantially the rate of increase in the GNP deflator (the latter

Similarly, if income transfers to the unemployed significantly affect their willingness to accept work, changes in the availability of unemployment insurance and other income support programs will affect NAIRU. Another factor is the amount of structural unemployment produced by localized declines in employment. The greater the mismatch of workers to jobs, either geographically or occupationally, the higher NAIRU will be. Labor market institutions also play a role: How heavily unionized are workers, and do unions place a higher priority on wage gains or on the size of their membership?

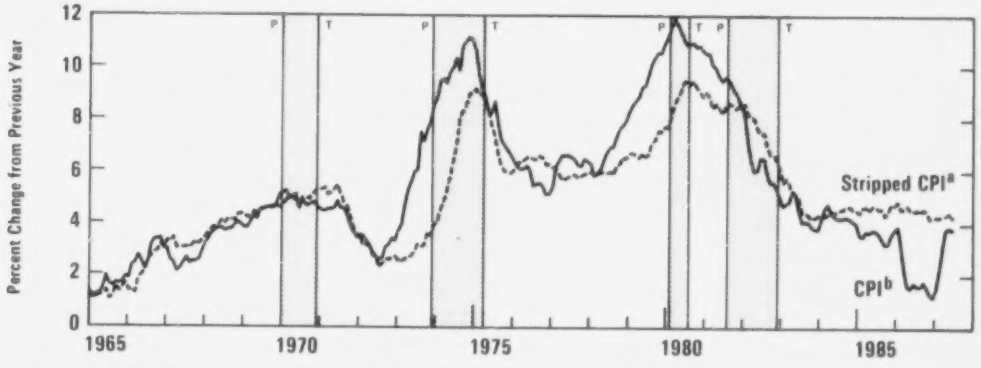
While it is difficult to quantify the influence of these and other factors, most of them seem to point to a reduction in NAIRU since the late 1970s. For instance, the proportion of young people in the total labor force rose rapidly from the early 1960s to the mid-1970s, but began declining markedly in the 1980s. Eligibility standards for many income support programs were tightened considerably during the early 1980s, and the percentage of the unemployed who are receiving unemployment insurance compensation has fallen from 47 percent in 1977 to 33 percent in 1986. Moreover, the proportion of workers belonging to unions has declined substantially since the mid-1970s. These factors tend to reduce NAIRU.

In spite of the variety of factors that may affect NAIRU, past estimates of the change in NAIRU from year to year have generally been able to isolate only the impact of changes in demographics. According to some simple calculations, the change in the age-sex composition of the labor force may have reduced NAIRU by a few tenths of a percentage point between 1979 and 1987, and will reduce it a few tenths more by 1992 (see Appendix B). For this reason, the forecast assumes that NAIRU fell from around 6 percent in 1981 to about 5.7 percent in 1987, and will continue to fall to around 5.5 percent in 1992.

excludes imports). The projected 5 percent trend decline in the exchange rate implies that on average CPI growth will remain above the growth of the GNP deflator through 1992, though by less than during the temporary burst of consumer price inflation that is likely to occur this year and next.

The Outlook for Oil Prices. The average cost of oil imported into the United States is now about $4 higher than CBO expected in January, mostly because of political developments that have enabled OPEC to tighten its control over production. The fundamentals of the oil market remain roughly as they have been for some time. OPEC could, if it wished, increase output by an amount equal to about 40 percent of total world oil supply outside the Soviet bloc. Worldwide demand remains weak for two reasons: slow income growth, and the residual effects of oil conservation following the very high oil prices of the early 1980s. No significant change in these fundamentals is

Figure I-7.
Measures of Inflation




SOURCES: Congressional Budget Office; Department of Labor, Bureau of Labor Statistics.

[a]CPI-U excluding food, energy, and used cars.

[b]CPI-U from January 1983 to present; before that time, the series incorporates a measure of homeownership that is conceptually similar to that of the current CPI-U.

anticipated in the next two years. Thus, oil prices can stay above the $6 to $9 range that approximates the unrestricted supply price only if OPEC (and some non-OPEC) producers maintain severe restrictions on their output. 8/ Recently, sharp increases in oil prices have followed news of political troubles in the Persian Gulf region. These increases are probably temporary, the result of precautionary purchases to bolster inventories in the event of a cutoff in Persian Gulf supplies. If there is no cutoff, higher inventories should depress prices, though if CBO's assessment is incorrect and oil prices do not moderate, higher inflation will ensue.

Few forecasters expect any large increase in oil prices in the near future (barring an adverse development in the Persian Gulf), but a sharp drop, though possible, appears less likely than it did earlier this year. This forecast thus assumes very little change in oil prices.

Food Prices. Increases in food prices have remained moderate throughout most of the last half-year. In May and June, meat prices jumped 4 percent, but these increases appear to be the result of a short-run reduction in supply. Meat supplies may remain somewhat short because farmers are holding

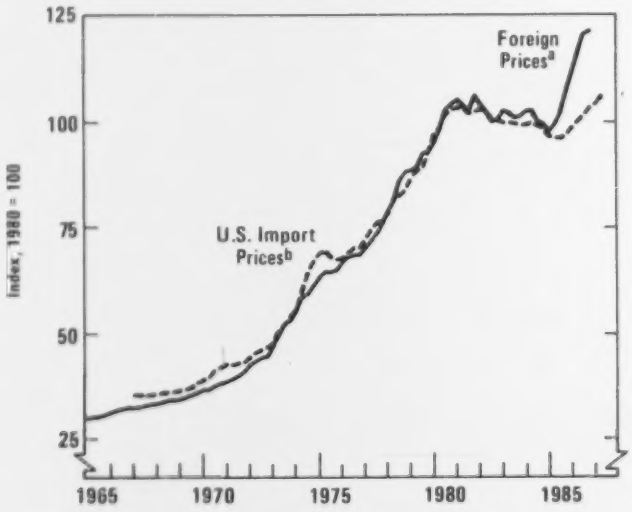
8. For CBO's analysis of the oil market, see Congressional Budget Office, *The Economic and Budget Outlook: Fiscal Years 1987-1991* (February 1986), pp. 38,39.

back animals from slaughter to breed them, and feeding their animals up to higher slaughter weights, both of which reduce near-term supplies. In part, these developments stem from the 1985 Food Security Act, which reduced grain prices and thus increased profits in cattle feeding. The larger supplies of meat from the larger herd will not reach consumers for a while.

Import Prices. Large increases in import prices have long been expected as a result of the rapid decline of the dollar since early 1985. But there has been little sign of large price increases for nonpetroleum imports. Those prices have increased at an annual rate of 5½ percent in the last five quarters, but this pace is far less than what would, at least on the basis of past historical performance, be expected to follow such a decline of the dollar. Figure I-8 shows how far U.S. nonpetroleum import prices have lagged behind the level of foreign prices converted to dollars. The reasons for this are not well understood. One frequently invoked factor contributing to this discrepancy is that exporters to the United States apparently gained large increases in profit margins as the dollar rose, and have been slimming these margins rather than raising prices. It is unlikely that this reduction in profit margins will continue indefinitely.

Thus, it seems likely that import prices will increase more rapidly over the next year, probably at double-digit rates for a time. This rise should add

Figure I-8.
Foreign and U.S. Import Prices




SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis; International Monetary Fund.

[a] Foreign consumer prices converted to U.S. dollars for 18 countries weighted by shares in U.S. nonpetroleum imports.

[b] Fixed-weight price index for nonpetroleum merchandise.

about one percentage point a year to the growth of the CPI from mid-1987 through the end of 1988.

Recent Wage Trends and Unit Labor Costs. By any of the most common measures, wage increases continued to be moderate in the first half of the year, particularly for wages in manufacturing. The Employment Cost Index for the private sector was up only 3.0 percent from its level four quarters earlier (see Table I-2 and Figure I-9). Moreover, wage increases have been particularly moderate in the unionized sector of the labor market. Major settlements reached during the four-quarter period ending in June of this year provided for an average wage increase of 1.5 percent in the first year and 2.0 percent annually over the life of the contract.

Real wages have shown little growth during the last decade. In 1980, they fell sharply as a result of higher energy prices. Volatile energy prices had an opposite effect in 1986, as the oil price drop temporarily boosted real wages. So far this year, real wages have been depressed again by higher energy prices.

Foreign competition is one of the major reasons for the low rate of growth of manufacturing wages. Presumably the fall in the dollar will ultimately force foreign suppliers to raise their prices, alleviating some of the competitive pressure on U.S. manufacturers and manufacturing wages.

In view of the strong growth of employment in service-producing industries, wage developments in that sector are of special interest. Even though growth in wages has been higher in the service-producing sector than in the goods-producing sector, the rate of wage growth in the services has remained moderate (see Table I-2). Thus, the Employment Cost Index does not show significant acceleration in wages in either service- or goods-producing industries.

Given the slow growth in wages, employers' labor costs have been rising at only a moderate pace, despite poor productivity performance. Unit labor costs of nonfarm businesses increased at a rate of about 2 percent to 3 percent during 1986 and the first half of 1987. In manufacturing, where wages have been rising more slowly and productivity more rapidly than in the service-producing sector, unit labor costs have been essentially unchanged since early 1986.

The Outlook for Wages. As discussed in the preceding section, wage growth continued to be moderate through the first half of 1987. Most analysts expect that wage growth will increase, particularly in manufacturing,

TABLE I-2. NOMINAL WAGE AND COMPENSATION RATES IN THE NONFARM BUSINESS SECTOR (Percent change over similar quarter of previous year)

| | 1984 IV | 1985 IV | 1986 IV | 1987 I | 1987 II |
|---|---|---|---|---|---|
| **Compensation** | | | | | |
| Compensation per Man-Hour a/ | 4.2 | 4.8 | 3.4 | 2.7 | 2.7 |
| Employment Cost Index b/ | 4.9 | 3.9 | 3.2 | 3.1 | 3.0 |
| Union | 4.3 | 2.6 | 2.1 | 1.6 | 1.9 |
| Nonunion | 5.2 | 4.6 | 3.6 | 3.6 | 3.4 |
| **Wages and Salaries** | | | | | |
| Average Hourly Earnings Index c/ | 2.8 | 3.1 | 2.3 | 2.2 | 2.3 |
| Employment Cost Index b/ | 4.1 | 4.1 | 3.1 | 3.2 | 3.0 |
| Union | 3.4 | 3.1 | 2.0 | 1.7 | 1.7 |
| Nonunion | 4.5 | 4.6 | 3.5 | 3.5 | 3.3 |
| Manufacturing | 4.4 | 3.6 | 3.3 | 2.7 | 2.4 |
| Nonmanufacturing | 4.0 | 4.5 | 3.0 | 3.3 | 3.2 |
| Service-producing | 4.4 | 4.7 | 3.0 | 3.4 | 3.4 |
| Goods-producing | 3.9 | 3.5 | 3.2 | 2.7 | 2.3 |
| White-collar | 4.4 | 4.9 | 3.4 | 3.9 | 3.3 |
| Blue-collar | 3.6 | 3.4 | 2.5 | 2.0 | 2.3 |

SOURCES: Congressional Budget Office; Department of Labor, Bureau of Labor Statistics; Department of Commerce, Bureau of Economic Analysis.

a. Quarterly data, not adjusted for overtime or for changes in the mix of industries or occupations.

b. Adjusted for overtime and for changes in the mix of industries and occupations; not seasonally adjusted.

c. Adjusted for overtime in manufacturing and for changes in the mix of industries.

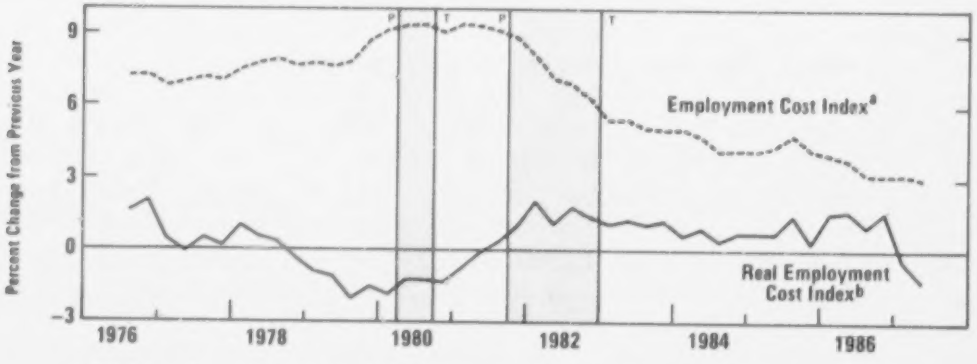
because of the recent decline in the unemployment rate and because many of the special factors--low food and oil prices--that held down wage growth in the recent past will be reversed. In addition, rapid increases in import prices would raise wage inflation. There is little agreement, however, about the extent of the likely increase. Analysts adduce three main arguments for expecting sharp wage increases:

- Surges in import prices have sometimes been quite fully reflected in higher wages. When oil and other commodity prices rose sharply in the 1970s, union workers in particular sought, and in part gained, protection from the increased cost of living, setting off a particularly intense inflationary spiral.

- The decline in the dollar since early 1985 has greatly improved the competitive position of U.S. producers. This is likely to improve both profits and wages.

- While unions have been weakened by the recession and by foreign trade pressures, some analysts believe that as soon as markets strengthen, unions will again adopt a highly aggressive stance toward wages.

Figure I-9.
## Private Nonfarm Wage Rates




SOURCES: Congressional Budget Office; Department of Labor, Bureau of Labor Statistics.

[a]Wages and salaries.

[b]Nominal index deflated by the implicit personal consumption deflator.

But other analysts point to reasons for expecting a continuation of recent moderate wage growth:

- Despite the decline of the dollar, little trade improvement has yet occurred, and substantial excess capacity still exists. This slack in the economy will work to hold down wage increases.
- Conditions in labor markets may have fundamentally changed since the 1970s. COLAs, or cost-of-living adjustment provisions in union contracts, are now much less prevalent than they were a decade ago, and a smaller proportion of the work force is covered by collective bargaining agreements.

It is unlikely that even sharply higher import prices will lead to a price-wage spiral and persistently higher rates of inflation, since import price pressures will be offset in part by the excess capacity in the economy. In addition, the Federal Reserve has moved to a less accommodative stance. Hence, wage growth is expected to increase over the next year, but by less than the increase in the CPI--implying a further decline in real wages.

## THE COMPOSITION OF DEMAND

The forces behind the economic expansion are shifting from those associated with falling interest rates and low inflation to those associated with an increase in real net exports.

Though GNP grew by 2.9 percent last year, growth was uneven among the various sectors. Falling interest rates and inflation encouraged consumer spending and residential construction. On the other hand, manufacturers remained under intense competitive pressure, and the energy and agriculture sectors were severely depressed. The recent decline in the dollar and increase in oil prices should ease some of these disparities, but CBO's forecast of continued moderate growth rests on the expectation of a large improvement in the real trade balance. Business fixed investment is likely to be sluggish for 1987 as a whole, but it should recover and show strong growth in 1988. Consumer spending growth will be constrained by a low rate of growth of disposable income, and housing is being adversely affected by tax reform and the increase in interest rates. The efforts to reduce the federal deficit are beginning to affect the growth of real federal expenditures on goods and services, and state and local government spending is unlikely to compensate for the decline in federal outlays.

Inventory building may tend to restrain growth in the near term, since nonfarm inventories accumulated rapidly in the first half of the year.

Inventories other than automobiles are still low relative to sales, however. While changes in producers' expectations of future sales can cause rapid shifts in desired inventories, there are no strong reasons to believe that inventories will be a major factor in either restraining or stimulating economic growth over the forecast horizon.

## Business Fixed Investment

Real business fixed investment has been in a decline, but the outlook seems to be changing. After two years of strong growth, investment fell 2.3 percent from 1985 to 1986. The weakness was concentrated in spending for structures, which fell by 13 percent in 1986. Investment in commercial structures has been weak because of less favorable tax treatment in the Tax Reform Act of 1986 (which was widely anticipated), and because of high vacancy rates for office buildings. Real spending on equipment decelerated, but still grew by about 3 percent in 1986. This year appears to be one of transition in which little, if any, real growth in investment is anticipated for the year as a whole. But since business investment fell sharply in the first quarter of 1987, holding steady for the year implies fairly solid performance for the rest of the year. Most forecasters expect moderate investment growth to continue in 1988.

One reason for the improved outlook is that the two special factors that depressed investment in structures in 1986 and early 1987--the cutback in oil drilling and the decline in commercial construction--seem to be largely over, though construction of office buildings may continue to be weak for some time yet. Another encouraging sign is the expected turnaround in the real trade balance, which should stimulate sales of manufactured goods and raise manufacturers' profit margins. Several financial factors are also encouraging. Corporate profits and cash flow have held up in spite of sluggish growth, and the stock market has made further gains (see Table I-3 and Figure I-10).

Some other factors are less clearly positive. Capacity utilization, at about 80 percent, is below its average for the 1967 to 1986 period (see Figure I-11); substantial idle capacity acts to depress investment. Orders for real nondefense capital goods--a precursor of changes in equipment investment--have recovered from the dip in the first half of 1986, but do not yet suggest much growth in investment (see Figure I-10). Similarly, the series on new capital appropriations by large manufacturers shows a recovery since the second and third quarters of 1986, but no sign of substantial strength.

TABLE I-3. CURRENT INDICATORS OF BUSINESS FIXED INVESTMENT AND SURVEYS OF CAPITAL SPENDING PLANS FOR 1987

| | 1985 | 1986 | 1986 I | 1986 II | 1986 III | 1986 IV | 1987 I | 1987 II |
|---|---|---|---|---|---|---|---|---|
| **Current Indicators** | | | | | | | | |
| Real Nondefense Capital Goods Orders (billions of 1982 dollars per month) | 29.8 | 30.1 | 29.4 | 28.9 | 30.4 | 31.8 | 30.1 | 32.9 |
| Manufacturers' Capital Appropriations (billions of dollars, quarterly rate) a/ | 27.2 | 21.4 | 23.4 | 20.0 | 20.2 | 22.1 | 23.0 | n.a. |
| Capacity Utilization (percent) | 80.4 | 79.4 | 80.0 | 79.2 | 79.1 | 79.3 | 79.6 | 79.6 |
| Corporate Economic Profits (billions of dollars, annual rate) b/ | 278 | 284 | 288 | 282 | 286 | 281 | 294 | n.a. |
| Corporate Cash Flow (billions of dollars, annual rate) c/ | 369 | 375 | 382 | 375 | 377 | 368 | 367 | n.a. |
| Corporate AAA Bond Rate (percent) | 11.4 | 9.0 | 9.6 | 9.0 | 8.8 | 8.7 | 8.4 | 9.2 |
| Standard and Poor's 500 Stock Index (annual percent change) | 16.4 | 26.5 | 55.5 | 43.1 | 1.0 | 4.3 | 72.6 | 21.6 |

**Surveys of Capital Spending Plans for 1987 (Percent Increase) d/**

| | Nominal | Real |
|---|---|---|
| Department of Commerce | 3.1 | 2.8 |
| McGraw-Hill | 3.3 | 0.0 |

SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis; McGraw-Hill, Inc.; Conference Board; Federal Reserve Board.

NOTE: n.a. = not available.

a. Because of the seasonal adjustment, the annual figure does not equal the average of the quarterly figures.

b. Economic profits are adjusted for inventory valuation and capital consumption allowances.

c. Corporate cash flow is the sum of undistributed profits with inventory valuation adjustment and capital consumption adjustment (CCA) plus capital consumption allowances with CCA.

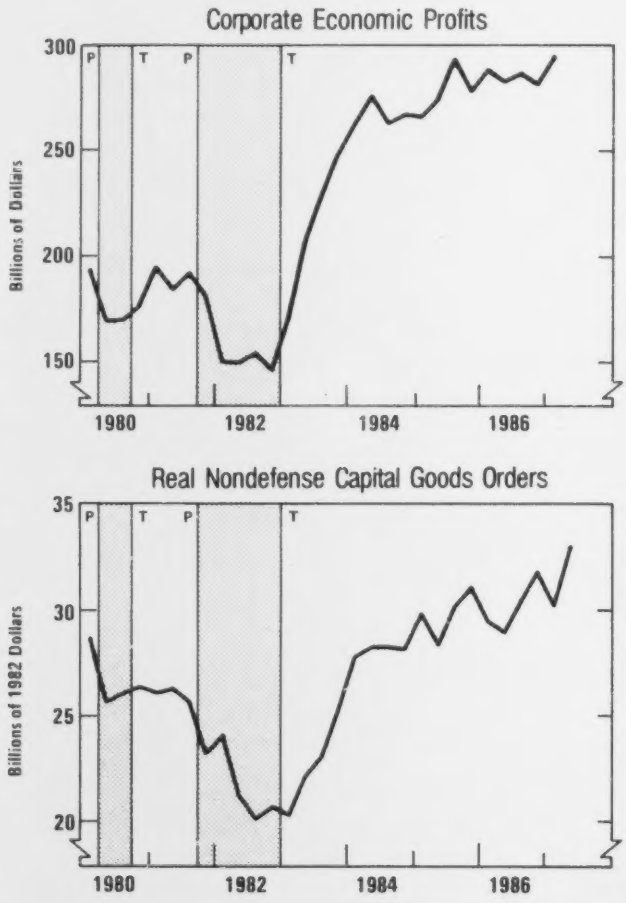
d. Conducted in April and May 1987.

Surveys of capital spending plans also suggest that a mild turnaround may be at hand. The most comprehensive survey available, conducted by the Commerce Department, shows an increase of 3.1 percent in nominal capital spending in 1987 compared with 1986. Using an extrapolation of recent price trends, the Commerce Department reports the expected increase in real terms to be 2.8 percent. Another survey, conducted by McGraw-Hill, shows a nearly identical rise in nominal spending. These surveys tend to be reliable indicators unless actual sales differ sharply from those expected at the time of the surveys.

## Consumption

Growth in consumption spending has been strong for the past four years, and from 1984 to 1986 it outpaced GNP. This pattern is not common in an

Figure I-10.
**Business Fixed Investment Indicators**



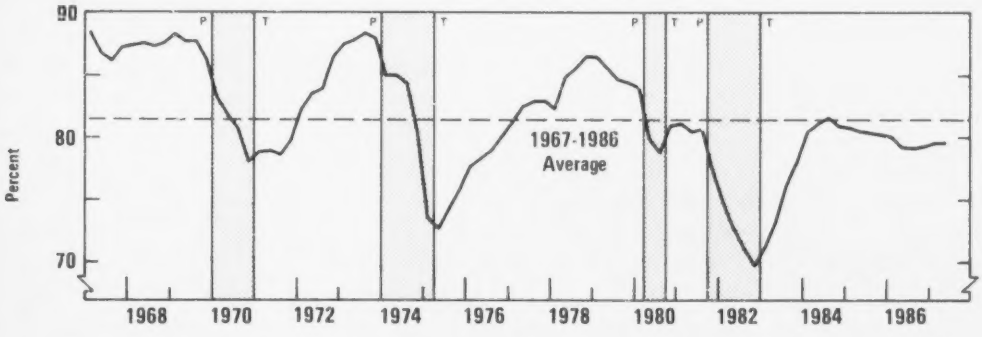

SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis.

expansion when other components of demand (especially investment) usually lead growth. From 1982 to the middle of 1986, consumption was sparked by growth in real income and declining interest rates; the latter not only lowered the costs of financing purchases of durable goods but also increased consumers' net worth. Growth in real income was strong largely because of the relatively slow rate of inflation. Prices of petroleum products and food fell, and, through early 1986, prices of imported goods grew very slowly. Consumption began to outpace income, however, and the personal saving rate fell from late 1984 to the present (see Figure I-12).

Beginning in the fourth quarter of 1986, however, consumption growth slowed considerably. Spending on nondurable goods weakened and purchases of durable goods fell sharply. Though some of the decline in durables was temporary--a result of changes in the sales incentives for autos, along with tax considerations--the overall trend over the last three quarters for both durable goods and total consumption has been toward slower growth.

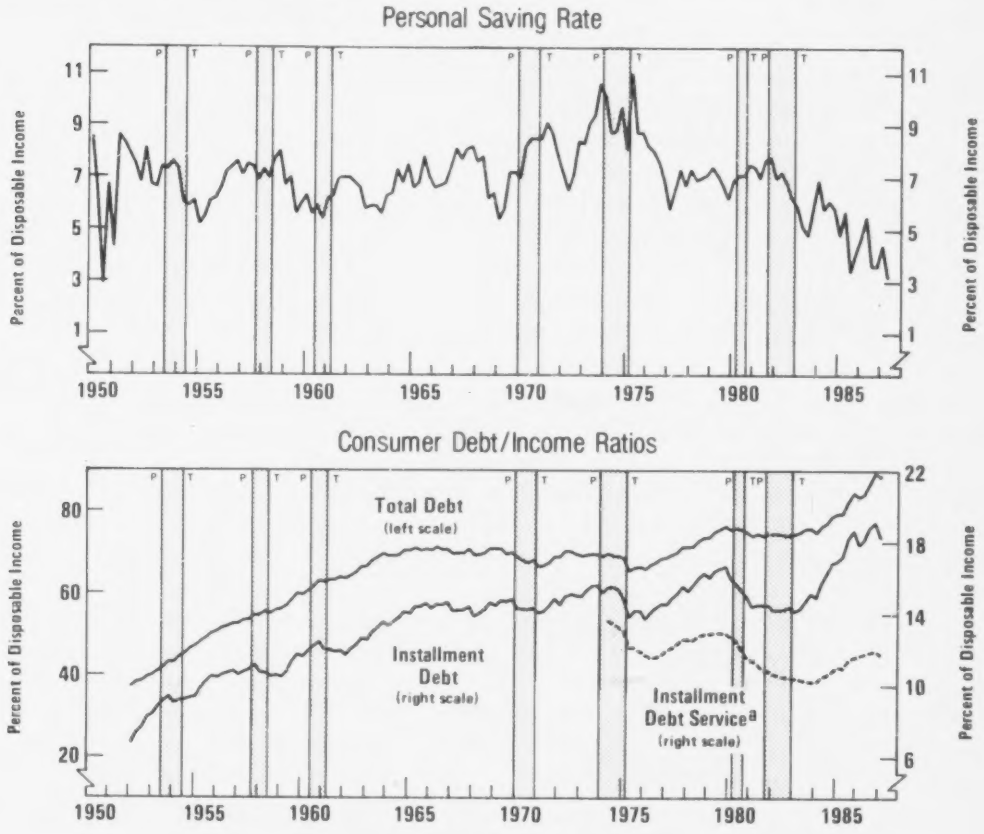
The main cause of the slowdown in consumer spending is low growth in real disposable income. In late 1986 and early 1987, labor incomes posted only moderate gains while inflation increased because of sharp increases in prices of petroleum products, apparel, and services. The net effect of these two factors was low growth in real personal income for the first half of 1987. In addition, two temporary factors reduced reported disposable income in early 1987: an increase in capital gains tax payments; and transi-

Figure I-11.
## Capacity Utilization




SOURCES: Congressional Budget Office; Federal Reserve Board.

Figure I-12.
Saving and Debt Measures




SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis; Federal Reserve Board; Goldman-Sachs.

[a]Required principal plus interest payments for installment debt. Estimated by Goldman-Sachs.

tory changes in agricultural subsidies. Because these factors are temporary, their combined effect on consumption was probably not large. They merely produced a temporary reduction in saving. 9/

The low personal saving rates of the last few years were associated with an increase in debt, which has raised concern over the financial health

9. The Tax Reform Act of 1986 reduced personal taxes (other than capital gains taxes), but these gains in disposable income were more than offset by inflation in the first half of 1987.

of the household sector. 10/ Total debt of the household sector as a percentage of disposable income has risen dramatically since 1982, and is at an all-time high (see Figure I-12). But the increase in debt is mitigated by several factors:

- The run-up in total household debt was more than matched by increases in the value of assets held by the household sector, particularly homes and corporate equities. Specifically, the net worth of the household sector increased 39 percent between the fourth quarter of 1982 and the fourth quarter of 1986.

- The ratio of installment debt service to income, according to calculations by Goldman-Sachs, is still below that of the late 1970s. This indicates that cash flow is not severely restricted. 11/

- Delinquency rates on consumer loans have fallen in the last year to their lowest levels since the early 1970s.

These factors indicate that the debt burden under existing circumstances is not excessive, although the size of the debt reduces the likelihood of rapid consumption growth in the near future.

The main determinant of consumer spending in the near term will probably continue to be real income. Real disposable income growth is not expected to be strong. Moreover, higher interest rates will raise consumers' cost of borrowing, and may also adversely affect future gains in the stock market. As a result, it seems likely that consumption will grow somewhat more slowly than disposable income between the third quarter of 1987 and the end of 1988, reversing recent trends and raising the saving rate slightly.

Residential Construction. Total housing starts have trended downward since early 1986, except for a brief surge in the first quarter of this year (see Table I-4). Much of the slowdown was caused by a slump in multifamily housing starts, which by the middle of 1987 had fallen to a pace less than two-thirds that of the first quarter of 1986. Contributing to the sluggishness in multifamily starts in the last half of 1986 were rising vacancy rates

10. Other measures of the personal saving rate, such as those that treat purchases of durables as an investment, or include corporate retained earnings and contributions to state and local pension funds, have also showed a downward trend over the last few years.

11. Mortgage interest rates over the last year have been at their lowest levels since 1978, suggesting that mortgage debt service--the major component of household debt--is also not excessive.

and the new tax law, which provides less favorable treatment of income from rental property not in service by the end of last year (see Figure I-13).

Single-family starts, on the other hand, fluctuated in response to movements in personal income and interest rates. The average interest rate on 30-year fixed-rate mortgages fell to its lowest level in nearly 10 years. This drop led to a surge in single-family starts in the first quarter of this year. In the second quarter, however, interest rates turned up sharply and personal income gains slowed, pushing single-family starts down again.

TABLE I-4. HOUSING

| | 1986 | | | | 1987 | |
|---|---|---|---|---|---|---|
| | I | II | III | IV | I | II |
| Starts (millions) | | | | | | |
| Single-family | 1.23 | 1.22 | 1.15 | 1.16 | 1.26 | 1.14 |
| Multifamily | 0.71 | 0.66 | 0.61 | 0.54 | 0.54 | 0.47 |
| Total | 1.94 | 1.88 | 1.76 | 1.70 | 1.80 | 1.61 |
| Sales (millions) | | | | | | |
| New | 0.79 | 0.79 | 0.69 | 0.71 | 0.72 | 0.68 |
| Existing | 3.30 | 3.48 | 3.59 | 3.89 | 3.62 | 3.62 |
| Total | 4.09 | 4.27 | 4.27 | 4.60 | 4.34 | 4.30 |
| Mortgage Interest Rates (percent) a/ | | | | | | |
| Thirty-year fixed-rate | 10.56 | 10.26 | 10.24 | 9.67 | 9.11 | 10.32 |
| One-year adjustable rate | 8.87 | 8.56 | 8.38 | 7.90 | 7.58 | 7.81 |
| Affordability Index b/ | 0.93 | 0.93 | 0.91 | 0.93 | 0.97 | 0.91 |

SOURCES: Congressional Budget Office; Federal Home Loan Mortgage Corporation; Department of Commerce, Bureau of Census.

a. Average contract rates of interest on conventional mortgage loans with loan-to-value ratios of 80 percent at major lenders surveyed weekly by the Federal Home Loan Mortgage Corporation.

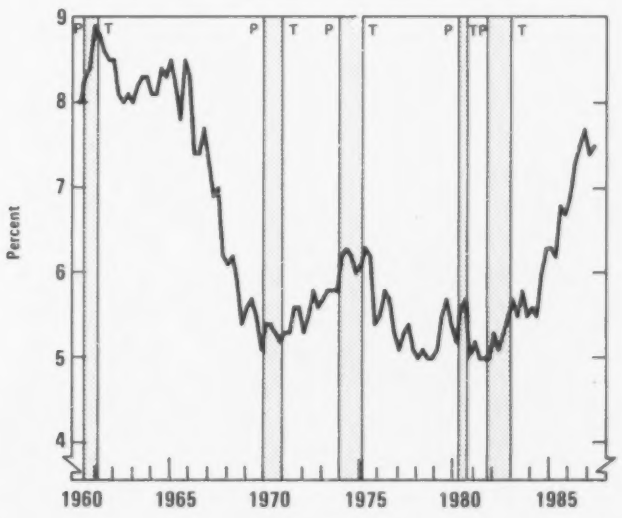
b. An affordability index of 1.00 implies that a median-income household could finance the median-priced home. An increase in the index means that homes are more affordable. Calculated by the Congressional Budget Office.

Total home sales trended upward through the first quarter of this year, reflecting the climb in the affordability index to its highest level in over eight years. (The affordability index measures the ability of the median-income household to service the mortgage loan needed to purchase the median-priced house.) Increasing interest rates, relatively slow gains in income, and a rise in house prices have reversed the rise in affordability, however, and home sales and housing starts fell in the second quarter and are expected to decline over the remainder of this year and most of 1988.

The Public Sector. In 1986, after increasing steadily for four years, the growth rate of real purchases by the public sector declined on a National Income and Product Accounts basis (see Table I-5). Despite some acceleration in the first half of 1987, very little growth is expected during the forecast period, as both federal defense purchases and state and local construction spending are expected to fall.

The growth of real federal purchases (excluding the activities of the Commodity Credit Corporation) declined in 1986, because of a slowing in the growth of defense spending (especially durable goods) and a decline in the level of nondefense purchases. During the first half of 1987, defense spending picked up, but federal purchases are projected to fall during the forecast period, reflecting the policies of the Budget Resolution for 1988.

Figure I-13.
Vacancy Rate for Rental Units




SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Census.

Following steady increases in growth rates from 1981 through 1986, real purchases by state and local governments have exhibited a lower rate of growth thus far this year. This deceleration reflects in large part a slowdown in construction spending from the extraordinary pace of last year. With passage of the highway and clean water bills, some growth in construction spending is expected during the remainder of 1987, but this growth is expected to be followed by a decline during 1988. Other state and local spending should continue at a modest pace.

TABLE I-5. GOVERNMENT PURCHASES OF GOODS AND SERVICES (By calendar year, on a national income accounting basis)

| | 1985 | 1986 | 1986 I | 1986 II | 1986 III | 1986 IV | 1987 I | 1987 II |
|---|---|---|---|---|---|---|---|---|
| | | | In Billions of 1982 Dollars | | | | | |
| Federal a/ | 312.0 | 324.7 | 314.6 | 325.0 | 333.3 | 325.8 | 329.8 | 335.4 |
| Defense | 236.7 | 250.7 | 240.0 | 250.1 | 259.8 | 252.7 | 257.4 | 262.4 |
| Non-defense a/ | 75.3 | 74.0 | 74.6 | 74.9 | 73.5 | 73.1 | 72.4 | 73.0 |
| State and Local | 402.7 | 422.1 | 415.5 | 421.0 | 424.6 | 427.1 | 432.3 | 435.9 |
| Structures | 48.3 | 54.4 | 52.9 | 54.9 | 55.2 | 54.5 | 56.7 | 57.1 |
| All other | 354.4 | 367.7 | 362.6 | 366.1 | 369.4 | 372.6 | 375.6 | 378.8 |
| | | | Percent Change (Annual Rate) | | | | | |
| Federal a/ | 6.5 | 4.1 | -2.5 | 13.9 | 10.6 | -8.7 | 5.0 | 7.0 |
| Defense | 8.3 | 5.9 | -1.8 | 17.9 | 16.4 | -10.5 | 7.6 | 8.0 |
| Non-defense a/ | 1.1 | -1.7 | -4.7 | 1.6 | -7.3 | -2.2 | -3.8 | 3.4 |
| State and Local | 4.1 | 4.8 | 7.1 | 5.4 | 3.5 | 2.4 | 5.0 | 3.4 |
| Structures | 6.4 | 12.6 | 34.7 | 16.0 | 2.2 | -5.0 | 17.2 | 2.9 |
| All other | 3.7 | 3.8 | 3.7 | 3.9 | 3.7 | 3.5 | 3.3 | 3.5 |

SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis.

a. Excludes purchases and sales by the Commodity Credit Corporation.

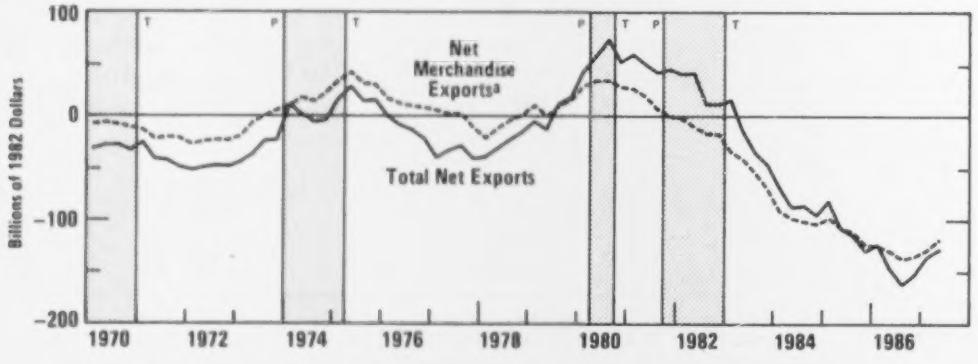
The budgets of state and local governments (excluding trust funds) registered a deficit of $9.1 billion in the first quarter of 1987--the first significant deficit in four years and the largest since 1975. Moderate deficits are expected throughout the forecast period, despite some windfall revenues from the Tax Reform Act of 1986, some increase in federal grants, and indications that many states plan to raise taxes. Trust-fund surpluses should continue to rise gradually, but the overall surplus of state and local governments will not provide as much offset to the federal deficit as in the recent past. Overall, however, the public-sector deficit is forecast to decline.

## Net Exports

The long-awaited trend toward smaller real trade deficits appears to have begun. On a National Income and Product Accounts basis, real net exports improved by almost $35 billion in the last three quarters. Though much of the improvement in the last quarter of 1986 and the first quarter of 1987 resulted from sharp reductions in petroleum imports that are not expected to recur, gains were also registered in the real nonpetroleum, nonagriculture merchandise trade balance (see Figure I-14).

Nonpetroleum import prices have not increased as much as would be expected given the magnitude of the dollar's depreciation over the last two years (though sharp increases in import prices are expected soon). The

Figure I-14.
Real Trade Balance




SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis.

[a]Nonpetroleum, nonagricultural merchandise.

anticipated fall in the growth rate of real imports is unlikely to occur unless inflation in import prices increases.

In contrast, the price movements that have already occurred imply a strong growth in real exports. Foreign currency prices of U.S. nonagricultural exports have fallen much more than the dollar prices of U.S. nonpetroleum imports have risen. This trend implies that even if the growth in imports is not slowed, a significant improvement in the real trade balance may occur because of strong growth in exports.

U.S. exports may be hampered by slow economic growth overseas. Forecasts for the major foreign industrial countries have been lowered in recent months, and their combined output--weighted by their shares in U.S. nonagricultural exports--is now expected to grow about 2.2 percent in 1987 (down from 2.7 percent in 1986) and about 2.5 percent per year over the medium term. Washington has not been successful in persuading other industrial countries to adopt more expansionary fiscal policies, except possibly in the case of Japan. 12/ On average, real growth in the developing countries and newly industralized countries, which is important for U.S. exports, is expected to be higher than in the developed world. For developed and developing countries together (weighted by U.S. nonagricultural export shares), growth is expected to be about 2.7 percent in 1987 (compared with 2.8 percent in 1986). Over the medium term, the aggregate foreign growth rate is assumed to be about 3.3 percent per year. The CBO forecast also assumes that inflation in foreign industrial countries will rise only moderately, and that the dollar will continue to depreciate in real terms against the currencies of developing and newly industrialized countries.

Weak agricultural exports and a surge in petroleum imports were a major cause of the deterioration in the trade balance through the third quarter of last year. These sectors are not expected to show further significant deterioration over the next 18 months, however. The outlook for agricultural exports has improved because of the fall in the dollar and drastic cuts in agricultural support prices made last year. In both nominal and real terms, agricultural exports are expected to grow strongly over the forecast horizon.

U.S. inventories of petroleum and petroleum products grew rapidly during the second and third quarters of 1986. After the inventory building stopped, oil imports fell sharply. Lower oil imports accounted for about $9

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12. Prime Minister Nakasone recently announced a stimulus package, which, at a rate of 150 yen to the dollar, is equal to $33.3 billion in extra spending and $6.7 billion in tax cuts.

billion of the improvement in real net exports in both the fourth quarter of 1986 and the first quarter of 1987. Inventories have been drawn down from their late 1986 levels, but real oil imports are expected to increase at only a moderate rate over the next year and a half.

The balance of payments has been helped in the past by an excess of income on U.S. investments abroad over income on foreign investment in the United States. The balance on these factor service flows is expected to deteriorate significantly in both nominal and real terms over the forecast horizon because of the increase in net U.S. liabilities to foreigners. The net corporate profit component of investment income will probably decline only slightly, but the huge increase in net U.S. indebtedness will cause the net interest payment component to worsen precipitously.

Total real net exports should improve by about $30 billion between the second quarter of 1987 and the last quarter of 1988 because of strong growth in nonagricultural merchandise exports and slowing growth in nonoil merchandise imports. Most of the net export improvement will come from strong growth in nonagricultural merchandise exports, but the growth rate of real merchandise imports is also expected to decline from 13 percent in 1986 to about 2 percent in both 1987 and 1988. The real balance on factor service flows, as noted above, is expected to deteriorate throughout the forecast period, even though the balance on flows of services other than investment income (that is, transportation, tourism, insurance, and so forth) should improve substantially.

## THE ECONOMIC FORECAST AND MEDIUM-TERM PROJECTIONS

CBO's economic projection has two parts: a short-term forecast of economic conditions through 1988, which is contingent on specific policy assumptions; and a medium-term projection through 1992 based on historical trends and other assumptions about economic growth.

### The Short-Run Forecast

The forecast is for continued moderate expansion over the next 18 months at a rate slightly above that of the past year. The forecast is based on the following assumptions:

- *Fiscal Policy.* Federal tax and spending policies are assumed to be consistent with the budget resolution for fiscal year 1988.

This marks a change from the January report, which assumed that fiscal policy satisfied the requirements of the Balanced Budget Act. As a result, the fiscal contraction assumed to occur between fiscal year 1987 and fiscal year 1988 is substantially smaller than that assumed last January.

- *Monetary Policy.* The Federal Reserve is assumed to be constrained by its concern that the temporary bulge in price increases this year should not become the base for a renewed inflationary spiral. This concern suggests that the Federal Reserve will try to prevent further sharp depreciation of the dollar. International interest-rate differentials will therefore be a major concern of Federal Reserve policy.

- *Exchange Rates.* The large nominal trade deficit should continue to exert downward pressure on the dollar, and it is assumed that although the Federal Reserve will be successful in its effort to prevent the dollar from falling too rapidly, the dollar will depreciate by about 5 percent against the currencies of the major industrial countries over the forecast horizon.

- *Prices.* The refiners' acquisition price of imported oil is assumed to rise gradually to about $20 per barrel by the end of 1988. Food prices are assumed to rise at about a 4½ percent rate until the end of 1988.

Given these assumptions, real GNP growth is projected at 3.1 percent in 1987 and 2.6 percent in 1988 (fourth quarter to fourth quarter), as shown in Table I-6. The forecast for 1987 is virtually unchanged from that made in January, and the 1988 figure is slightly below that of January.

Prices. The dollar has fallen sharply and the world price of oil has risen since the January forecast was prepared. Because of these developments, the CPI is expected to rise a little more than 5 percent in 1987 and 1988 (fourth quarter over fourth quarter). These inflation rates represent an increase over the January forecast of more than half a percentage point in both 1987 and 1988. Because this inflation is primarily driven by import prices, the GNP deflator is expected to rise more slowly than the CPI, at around 4 percent in both 1987 and 1988 (fourth quarter over fourth quarter).

Income Shares. The Department of Commerce revised its estimates of income for 1986 and the first quarter of 1987 significantly in its recent re-

lease of the National Income and Product Accounts. Corporate profits were revised down by about $40 billion in the first quarter of 1987. Personal interest income was revised upward by about $30 billion, and farm income (excluding subsidies) and wage and salary disbursements were each revised upward by about $20 billion. These revisions in personal income assign a larger proportion of personal income to components that generate relatively low tax collections and also--by many estimates--less consumption.

Wage growth is expected to be moderate for the rest of 1987 and 1988--faster than the GNP deflator but slower than the CPI. CBO does not expect a price-wage spiral to develop. For 1987 and 1988, the share of wages and salaries in GNP should remain close to its 1986 level.

Other taxable income, which includes personal interest income, dividends, and proprietors' income, is expected to rise at about the same rate as GNP, keeping its share of GNP relatively flat for the short-term forecast.

TABLE I-6. THE CBO FORECAST FOR 1987 AND 1988

| | Actual | | Forecast | |
|---|---|---|---|---|
| | 1985 | 1986 | 1987 | 1988 |
| **Fourth Quarter to Fourth Quarter (percent change)** | | | | |
| Nominal GNP | 6.6 | 4.5 | 7.2 | 6.8 |
| Real GNP | 3.3 | 2.2 | 3.1 | 2.6 |
| Implicit GNP Deflator | 3.2 | 2.2 | 4.0 | 4.2 |
| CPI-W a/ | 3.3 | 0.9 | 5.1 | 5.2 |
| **Calendar-Year Averages (percent)** | | | | |
| Unemployment Rate | 7.2 | 7.0 | 6.3 | 6.1 |
| Three-Month Treasury Bill Rate | 7.5 | 6.0 | 5.9 | 6.6 |
| Ten-Year Government Bond Rate | 10.6 | 7.7 | 8.1 | 8.5 |

SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis; Department of Labor, Bureau of Labor Statistics.

a/ Consumer Price Index for urban wage earners and clerical workers.

Corporate profits are expected to grow moderately over the next 18 months. Rising import prices will allow firms to rebuild their profit margins, but at the same time higher interest payments should cut into profits. As a share of GNP, therefore, profits are expected to remain roughly flat over the period of the short-term forecast.

Financial Markets. The Federal Reserve will probably seek to moderate further depreciation of the dollar. To do so, it will need to keep interest-rate differentials wide enough so that foreigners will continue to finance the large current account deficit by acquiring more dollar-denominated assets. Both short- and long-term rates increased in the first half of this year. Short-term rates are expected to continue to increase through the beginning of 1988, and decline thereafter. Long-term rates are expected to remain near their current levels to the end of 1988.

Aggregate Demand. The outlook for aggregate demand in the short term does not support a forecast of strong growth. Although real net exports are likely to improve, and the investment anticipations surveys point to a recovery in business fixed investment, the other major categories of final demand will be weak in real terms. Consumption expenditures are expected to slow, reflecting weak growth in real incomes of consumers, and federal spending on goods and services will be restrained by efforts to reduce the deficit. State and local government purchases are also expected to grow more slowly than GNP, while residential investment is likely to be adversely affected by tax reform and the recent rise in interest rates.

Uncertainties. Economic forecasts are always uncertain, and errors in the economic forecast are an important source of errors in the forecast of the federal deficit. Chapter III examines CBO's economic forecast record and the extent to which errors in forecasts have affected the deficit forecasts.

It is impossible, of course, to foresee the precise nature of errors in the current forecast, which does not differ substantially from those of other forecasters. However, some possibilities are of special concern:

- *Import Prices.* The massive dollar depreciation of the past two years has not yet been fully reflected in import prices. Moreover, the foreign exchange value of the dollar could change rapidly and unexpectedly. The rate of increase in import prices could be greater than that embodied in the forecast, and therefore inflation could be higher than indicated.

- *Slow Improvement in Trade.* The forecast for growth in demand relies heavily on improvements in net exports which are

notoriously difficult to predict. The Federal Reserve may be faced with a dilemma if real net exports do not continue to improve: either to allow the economy to slide into a recession, or to abandon its attempts to prop up the dollar and risk another round of rapid dollar depreciation that could also be the precursor of even greater inflation.

- *Oil Prices.* Concern over the very tense situation in the Persian Gulf has already shown up in a sharp rise in oil futures. A continuation or escalation of tensions in the Gulf could lead to higher oil prices and hence higher inflation and lower real income growth than are currently forecast.

- *Consumer Spending.* The consumer could cut back sharply in response to increased inflation and interest rates, or to a decline in the stock market.

## Medium-Term Projections

CBO's medium-term economic projections for the period from 1989 through 1992 are presented in Tables I-7 and I-8. Real GNP is projected to grow at an average annual rate of about 2.7 percent over the period, and the civilian unemployment rate to fall to 5.7 percent by 1992. The inflation rate (as measured by the GNP deflator) is expected to remain at the pace forecast for 1988, and interest rates are assumed to be close to current levels. Projected growth rates in real GNP and the GNP deflator for the 1989-1992 period are slightly lower than were projected in January, while interest rates and the growth in the CPI are somewhat higher.

These values are projections rather than forecasts in that, to a substantial degree, they simply reflect historically normal values and relationships among economic series. The methods used to make these projections are described below.

Real Output. Real gross domestic product (GDP) is used for making medium-term projections. 13/ It is preferred to the GNP measure because GDP relates more closely to employment and federal revenues. To arrive at the projection of real GDP, it was assumed that steady growth beyond 1988

13. GDP is equal to GNP less net factor service flows (that is, income earned on factors of production located overseas and owned by U.S. residents less income earned on factors located in this country but owned by non-U.S. residents).

TABLE I-7. MEDIUM-TERM ECONOMIC PROJECTIONS FOR CALENDAR YEARS 1989 THROUGH 1992

| | Actual | Forecast | | Projected | | | |
|---|---|---|---|---|---|---|---|
| | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
| Nominal GNP (billions of dollars) | 4,235 | 4,486 | 4,797 | 5,119 | 5,469 | 5,843 | 6,243 |
| Nominal GNP (percent change) | 5.6 | 5.9 | 6.9 | 6.7 | 6.8 | 6.8 | 6.8 |
| Real GNP (percent change) | 2.9 | 2.6 | 2.7 | 2.6 | 2.7 | 2.7 | 2.7 |
| Implicit GNP Deflator (percent change) | 2.6 | 3.3 | 4.1 | 4.0 | 4.0 | 4.0 | 4.0 |
| CPI-W (percent change) | 1.6 | 3.8 | 5.2 | 4.8 | 4.4 | 4.4 | 4.4 |
| Unemployment Rate (percent) | 7.0 | 6.3 | 6.1 | 6.0 | 5.9 | 5.8 | 5.7 |
| Three-Month Treasury Bill Rate (percent) | 6.0 | 5.9 | 6.6 | 5.8 | 5.7 | 5.7 | 5.7 |
| Ten-Year Government Bond Rate (percent) | 7.7 | 8.1 | 8.5 | 7.8 | 7.4 | 7.1 | 6.8 |
| Corporate Profits (percent of GNP) | 6.7 | 6.6 | 6.6 | 6.7 | 6.7 | 6.8 | 6.7 |
| Wage and Salary Disbursements (percent of GNP) | 49.3 | 49.3 | 49.2 | 49.2 | 49.3 | 49.3 | 49.4 |
| Other Taxable Income (percent of GNP) | 20.9 | 21.2 | 21.0 | 20.8 | 20.6 | 20.4 | 20.2 |

SOURCE: Congressional Budget Office.

TABLE I-8. MEDIUM-TERM ECONOMIC PROJECTIONS FOR FISCAL YEARS 1989 THROUGH 1992

| | Actual | Forecast | | Projected | | | |
|---|---|---|---|---|---|---|---|
| | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
| Nominal GNP (billions of dollars) | 4,189 | 4,409 | 4,718 | 5,035 | 5,380 | 5,747 | 6,141 |
| Nominal GNP (percent change) | 6.1 | 5.2 | 7.0 | 6.7 | 6.8 | 6.8 | 6.8 |
| Real GNP (percent change) | 3.2 | 2.4 | 2.8 | 2.6 | 2.7 | 2.7 | 2.7 |
| Implicit GNP Deflator (percent change) | 2.8 | 2.8 | 4.1 | 4.1 | 4.0 | 4.0 | 4.0 |
| CPI-W (percent change) | 2.1 | 2.7 | 5.1 | 5.0 | 4.4 | 4.4 | 4.4 |
| Unemployment Rate (percent) | 7.0 | 6.5 | 6.1 | 6.0 | 5.9 | 5.8 | 5.8 |
| Three-Month Treasury Bill Rate (percent) | 6.4 | 5.6 | 6.6 | 5.9 | 5.7 | 5.7 | 5.7 |
| Ten-Year Government Bond Rate (percent) | 8.3 | 7.8 | 8.5 | 8.0 | 7.5 | 7.2 | 6.9 |
| Corporate Profits (percent of GNP) | 6.8 | 6.6 | 6.5 | 6.7 | 6.7 | 6.8 | 6.8 |
| Wage and Salary Disbursements (percent of GNP) | 49.3 | 49.4 | 49.2 | 49.2 | 49.3 | 49.3 | 49.4 |
| Other Taxable Income (percent of GNP) | 20.8 | 21.0 | 21.1 | 20.9 | 20.7 | 20.4 | 20.2 |

SOURCE: Congressional Budget Office.

would narrow the gap between actual GDP and CBO's estimate of potential GDP (see Appendix B), until the gap reached its historical average value of 0.5 percent in 1992. This path implies that real GDP grows at an annual rate of 2.8 percent from the end of 1988 through the end of 1992. Chiefly because the United States is projected to continue increasing its foreign indebtedness, albeit at a slower rate than in the recent past, net income earned abroad by U.S. residents declines throughout the 1989-1992 period. Thus, average real GNP growth is lower than real GDP growth over the period--2.7 percent compared with 2.8 percent.

Prices and Interest Rates. The 4.0 percent per year projection of growth in the GNP deflator is slightly below its postwar average and appears to be consistent with current underlying price trends. Unlike the GNP deflator, the CPI-W contains the prices of imported goods and, given the projected trend decline in the foreign exchange value of the dollar, rises more rapidly than the GNP deflator--at 4.4 percent per year.

Interest rates were determined by assuming that the rate on 91-day Treasury bills after adjusting for CPI inflation would revert to 1.3 percent, which is approximately its average value since the Korean War. 14/ In turn, it was assumed that, by 1992, the yield spread between the bill rate and the 10-year bond rate would also revert to the average level that prevailed over the same period. This level implies a decline in the long rate over the projection horizon.

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14. This calculation used a CPI series constructed by CBO that attempts to adjust the published series for changes in the treatment of homeownership costs.

CHAPTER II

# THE BUDGET OUTLOOK

The federal deficit in the fiscal year that ends September 30 will be about $157 billion--more than $60 billion below last year's record-breaking level. But the good news is short-lived. If current taxing and spending policies continue unchanged, the deficit will reach $183 billion in 1988 and $192 billion in 1989 before finally declining.

The estimated deficit jumps after 1987 because special factors that reduce this year's deficit will not persist. The deficit improvement this year is less impressive than it first appears since it reflects a first-year bonus from tax reform, as well as the sale of federal government assets and other one-time savings. But tax reform raises the deficit in 1988 and 1989 compared with prior law, and one-time outlay savings fade. Adjusted for these special factors, the deficit would fall steadily as a percent of gross national product (GNP) from 1987 through 1992. The deficit's decline as a share of GNP, however, is more gradual than in earlier estimates.

In June, the Congress approved a blueprint for reducing the deficit for the next three years. The Congressional budget resolution--if fully implemented (as is assumed in the economic forecast described in Chapter I)--would reduce the deficit to $146 billion in 1988, with further reductions in later years. To achieve these savings, the Congress will consider a package of revenue increases and spending reductions this fall.

Even with the policies of the Congressional budget resolution, the deficit remains stubbornly above the targets in the Balanced Budget Act. Two years ago the act set a deficit target of $108 billion in fiscal year 1988. Before recessing in early August, the Congress debated but did not enact any of several competing proposals to amend the Balanced Budget Act's targets and enforcement provisions. On August 20, the Congressional Budget Office and the Office of Management and Budget (OMB) will jointly estimate the extent of across-the-board reductions in spending that would be needed to reach the original $108 billion target. This chapter previews CBO's contribution to the joint report. The Congress is set to resume work on changes to the Balanced Budget Act upon returning in September.

Because most attention now focuses on the fiscal year 1987 outcome and 1988 budget choices, this chapter first discusses the short-run outlook in some detail. Later sections describe the five-year budget outlook under current taxing and spending policies, explaining in particular why the deficit outlook deteriorates after 1987. This discussion also illuminates how tax reform and various one-time outlay savings cause projected deficits to fluctuate from one year to the next. The Congressional budget resolution's strategy for reducing deficits through revenue increases and spending cuts is then described. The chapter concludes by depicting the budget outlook in terms of the National Income and Product Accounts used by most economists for macroeconomic analysis and forecasting.

## THE SHORT-RUN BUDGET OUTLOOK

Last February, CBO projected that the federal deficit for fiscal year 1987 would reach $176 billion. The estimates of many private analysts were even higher. All of these estimates, however, were wrong. With most of the fiscal year over, the deficit appears likely to be $18 billion below CBO's earlier projection. The major explanation is higher-than-projected receipts; outlays are very close to the earlier estimates. But the improvement in the deficit does not persist into fiscal year 1988.

### 1987 Budget Estimates

In fiscal year 1987, federal government outlays will exceed $1 trillion for the first time. Total spending will reach about $1,010 billion--an increase of only 2 percent over 1986. But the slightly higher spending is more than offset by higher revenues. Fiscal year 1987 revenues should reach about $853 billion, an increase of 11 percent over 1986. The resulting deficit is about $157 billion (see Table II-1).

Higher individual income taxes contribute most to 1987's strong revenue growth. The Tax Reform Act of 1986 was expected to boost revenues in the first year, because many taxpayers would realize capital gains before a rate increase took effect. But the tax estimators underpredicted the bonus. As a result, greater-than-expected taxes flowed into the Treasury in early 1987. Nonwage incomes have also been stronger than projected, boosting income taxes. Finally, withheld income taxes in 1987 consistently exceeded earlier estimates. Millions of wage and salary earners apparently chose to maintain the same relative overwithholding on their newly reduced liabilities as they filled out forms mandated by the Tax Reform Act, contrary to earlier assumptions that overwithholding would be reduced.

The revenue news in 1987 is not uniformly positive: corporate income taxes will fall $15 billion short of earlier estimates. Part of the shortfall stems from lower-than-projected profits. Nearly all of the rest comes from a smaller net gain from tax reform, reflecting smaller gains from repealing the investment tax credit and greater losses from depreciation provisions.

Previous estimates of federal government spending in 1987, which were described in detail in reports published last winter, need little revision. Enacted legislation (mainly a supplemental appropriation bill) adds $3 billion to outlays. Higher interest rates add about $1 billion but are largely offset by lower unemployment insurance outlays and valuation gains on the government's foreign exchange holdings. Technical reestimates reduce outlays for farm price supports, deposit insurance, and Social Security more than enough to offset scattered spending increases. Finally, changing the budgetary treatment of the new thrift fund for federal employees--as recommended by the General Accounting Office--raises 1987 outlays by $1 billion.

## The Budget Outlook for 1988

In contrast to 1987, the deficit outlook for fiscal year 1988 has deteriorated. The most recent estimates for fiscal year 1988 highlight the

TABLE II-1. THE OUTLOOK FOR FISCAL YEARS 1987 AND 1988
(In billions of dollars)

| | | 1988 | | |
|---|---|---|---|---|
| | 1987 Estimate | CBO Baseline Projection | Base for Balanced Budget Act | Budget Resolution Policies |
| Total (Including Social Security) | | | | |
| Outlays | 1,010 | 1,080 | 1,067 | 1,064 |
| Revenues | 853 | 897 | 897 | 918 |
| Deficit | 157 | 183 | 170 | 146 |

SOURCE: Congressional Budget Office.

difficulty of achieving the Balanced Budget Act's original deficit target of $108 billion. Because Congressional action is incomplete, it is too early to predict the 1988 budgetary tallies. But three sets of projections may be compared (see Table II-2):

TABLE II-2. DIFFERENCES AMONG CBO BASELINE, BASE FOR SEQUESTRATION, AND BUDGET RESOLUTION FOR FISCAL YEAR 1988 (In billions of dollars)

| | Revenues | Outlays | Deficit |
|---|---|---|---|
| CBO Baseline | 897 | 1,080 | 183 |
| Differences | | | |
| Exclusion of discretionary inflation and other adjustments to 1987 appropriation levels | | | |
| Defense programs | | -5 | -5 |
| Nondefense programs | | -8 | -8 |
| Adjustment in net interest costs | | a/ | a/ |
| Total differences | 0 | -13 | -13 |
| Base for Balanced Budget Act | 897 | 1,067 | 170 |
| Differences | | | |
| Assumed spending changes | | | |
| Defense programs | | 3 | 3 |
| Nondefense programs | | -4 | -4 |
| Assumed revenue increases | 21 | | -21 |
| Adjustments in net interest costs | | -1 | -1 |
| Total differences | 21 | -2 | 23 |
| Budget Resolution Policies | 918 | 1,064 | 146 |

SOURCE: Congressional Budget Office.

a. Less than $500 million.

- The CBO baseline. Without further policy changes, the 1988 deficit is expected to be $183 billion.

- The base for sequestration. The starting point for calculating across-the-board spending cuts under the Balanced Budget Act currently excludes certain inflation adjustments that are included in the baseline, in effect freezing many programs at 1987 dollar levels. The resulting deficit is $170 billion, $13 billion lower than the baseline.

- The budget resolution. The taxing and spending blueprint adopted by the Congress in June would reduce the 1988 deficit to about $146 billion, or $37 billion below the baseline.

The Baseline. The baseline shows where the budget is headed if current taxing and spending policies remain unchanged. It is not a prediction of future budgets, which will doubtless include numerous policy changes.

An earlier report, *The Economic and Budget Outlook: Fiscal Years 1988-1992* (January 1987), described in detail the methods and assumptions used by CBO to project the budget under current policies. Generally, federal government revenues as well as spending for programs like Social Security, Medicare, and other entitlements are projected according to laws now on the books. The revenue projections, however, assume the extension of certain trust fund taxes beyond their currently scheduled expiration dates--namely, Airport and Airway Trust Fund taxes in 1987 and Hazardous Substance Superfund taxes in 1991. Many government activities are funded annually through the appropriation process; for these programs, 1987 funding levels are adjusted for inflation. Finally, offsetting receipts (for example, receipts from oil leases) are estimated in light of current laws and policies, and net interest payments in light of the assumed interest rates and deficits.

The baseline projections for 1988 are shown in Table II-1. Revenues of $897 billion are only about 5 percent higher than 1987's projected totals, largely because the first-year gain from tax reform is temporarily reversed. Spending in categories other than nondefense discretionary and interest also increases about 5 percent in the aggregate. (Detailed projections of spending by category appear later in Table II-4.) But interest outlays rise 9 percent in response to recent increases in interest rates and continued deficit financing, and nondefense discretionary outlays increase by 12 percent as one-time savings in 1987 disappear. Total outlays reach $1,080 billion, and the projected baseline deficit is $183 billion.

Base for Sequestration. The Balanced Budget Act of 1985 provides for across-the-board cutbacks when projected deficits exceed the law's targets. The act also mandates very specific assumptions to be used in projecting the deficits when Congressional action on the budget is not final. These assumptions differ somewhat from those used for the baseline. The main difference affects assumptions about appropriations. In the absence of final Congressional action, the base for sequestration must assume no change from the amounts appropriated for 1987--even to reflect inflation--whereas the baseline contains such adjustments. Base outlays for possible sequestration in 1988 are estimated at $1,067 billion, revenues at $897 billion, and the deficit at $170 billion. Table II-2 shows differences among the baseline, the budget resolution, and the starting point for sequestration in 1988.

To reach the Balanced Budget Act's original deficit target wholly through sequestration, the Congress would need to approve across-the-board reductions of almost one-fifth in defense budgetary resources and one-fourth for nondefense programs. These percentages are very high because many programs are exempt from sequestration, and because the lags in government spending require large changes in spending authority to achieve short-run outlay savings.

The percentage reductions eventually considered by the Congress may differ from these for three reasons. First, the law requires that across-the-board reductions depend on an average of CBO and OMB projections; the two agencies often differ for economic and technical reasons and over interpretation of the law. Second, the law requires a second report by the two agencies in early October. That report will reflect any Congressional action accomplished by that time. Third, the law may be changed to permit a higher deficit target or to limit the maximum sequestration in 1988. Other changes in the law may modify the calculation of the base deficit, for example, by reinstating inflation adjustments or resolving the current disagreements in interpreting the law.

Congressional Budget Resolution. The Congressional budget resolution, if fully implemented, would reduce the 1988 deficit to $146 billion--about $37 billion lower than the baseline. In September, Congressional committees are to report deficit reductions totaling $30 billion to comply with their reconciliation instructions. These reconciliation savings mainly boost revenues and governmental fees and reduce entitlement programs (such as farm price supports and Medicare). The remaining savings ordered by the budget resolution are to occur primarily in the appropriation process this fall. More detail about the savings in the budget resolution for 1988 and subsequent years appears later in this chapter.

## THE BUDGET OUTLOOK THROUGH 1992

Without further changes in budgetary policies, 1987's striking deficit improvement will prove ephemeral. The baseline deficit is projected to increase in both 1988 and 1989, before declining slightly. Moreover, it will remain above $150 billion through 1992. As a percent of GNP, the deficit climbs to almost 4 percent in 1988 and 1989 before declining to 2.5 percent in 1992. These deficit projections are more pessimistic than estimates made earlier this year, primarily because of lower economic growth and higher interest rates.

Table II-3 shows the updated projections of revenues, outlays, and the deficit. By showing separate totals for on- and off-budget revenues and

TABLE II-3. CBO BASELINE PROJECTIONS OF REVENUES, OUTLAYS, AND DEFICITS (By fiscal year, in billions of dollars)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|
| Total (Including Social Security) | | | | | | |
| Revenues | 853 | 897 | 954 | 1,036 | 1,115 | 1,195 |
| Outlays | 1,010 | 1,080 | 1,146 | 1,212 | 1,280 | 1,345 |
| Deficit | 157 | 183 | 192 | 176 | 165 | 151 |
| On-budget (Excluding Social Security) | | | | | | |
| Revenues | 639 | 655 | 694 | 752 | 808 | 867 |
| Outlays | 816 | 876 | 929 | 981 | 1,035 | 1,087 |
| Deficit | 177 | 221 | 236 | 229 | 227 | 219 |
| Off-budget (Social Security) | | | | | | |
| Revenues | 213 | 242 | 260 | 284 | 307 | 327 |
| Outlays | 194 | 204 | 216 | 230 | 244 | 259 |
| Surplus | 19 | 38 | 44 | 54 | 63 | 69 |

SOURCE: Congressional Budget Office.

spending, Table II-3 also underscores the extent to which growing surpluses in the Social Security program help to hold down the overall deficit. Table II-4 augments the summary information on these latest projections, showing revenues by source and spending by category.

In the past few years, the Congress has enacted several pieces of legislation that result in fairly sharp year-to-year swings in revenues and outlays. As discussed below, without these unusual factors the deficit would be much higher in 1987 but would decline steadily--as a percent of GNP--thereafter.

Revenues. Because most federal government tax dollars come from individual income and payroll taxes and corporate income taxes, revenues depend heavily on the economy. In fact, in the absence of tax reform, revenues would average a steady 19.3 percent to 19.4 percent of GNP throughout the 1988-1992 period (Table II-5), up from 18.9 percent in 1987. Revenues would grow slightly faster than GNP because of scheduled Social Security tax increases in 1988 and 1990, and because taxpayers would move gradually into higher brackets as economic growth continues.

As Table II-5 shows, however, tax reform significantly affects the annual revenue path. Tax reform boosted revenues an estimated $20 billion in 1987 but will lower them by $12 billion and $18 billion in 1988 and 1989, respectively, measured relative to prior law. Tax reform raises corporate income taxes in every year--by amounts ranging from $19 billion in 1987 (including the cash effects of the retroactive repeal of the investment tax credit) to $27 billion in 1992. In 1990 and later, the increasing corporate tax burden is approximately offset by individual income tax reductions. But reductions in tax rates on personal income dominate the revenue-raising elements of tax reform in 1988 and 1989, causing tax reform to depress revenue growth in those years.

Revenues are now projected to be lower in all years (except 1987) than estimates published in February. As Table II-6 shows, the macroeconomic forecast is the main reason for the changes. The revisions reflect slower economic growth and a revised distribution of national income among the major tax bases. Personal income as a share of GNP is higher, and corporate profits lower, than projected in February. The upward revisions in the personal income share are almost exclusively in less heavily taxed sources of income, particularly interest and entrepreneurial income. Both wage and profit levels are down for most of the forecast period, driving down receipts from personal income, payroll, and corporate income taxes.

TABLE II-4. UPDATED CBO BASELINE PROJECTIONS FOR FISCAL YEARS 1987 THROUGH 1992

| | 1986 a/ | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|---|
| | | | | In Billions of Dollars | | | |
| Revenues | | | | | | | |
| Individual income | 349 | 393 | 393 | 422 | 462 | 502 | 544 |
| Corporate income | 63 | 85 | 99 | 107 | 121 | 130 | 139 |
| Social insurance | 284 | 302 | 331 | 351 | 379 | 407 | 432 |
| Other | 73 | 74 | 74 | 74 | 75 | 76 | 79 |
| Total | 769 | 853 | 897 | 954 | 1,036 | 1,115 | 1,195 |
| Outlays | | | | | | | |
| Defense | 273 | 280 | 291 | 305 | 318 | 333 | 348 |
| Entitlements | 457 | 477 | 506 | 541 | 577 | 618 | 661 |
| Nondefense discretionary | 170 | 168 | 189 | 198 | 209 | 215 | 222 |
| Net interest | 136 | 137 | 150 | 161 | 170 | 179 | 184 |
| Offsetting receipts | -47 | -52 | -56 | -59 | -62 | -66 | -69 |
| Total | 990 | 1,010 | 1,080 | 1,146 | 1,212 | 1,280 | 1,345 |
| Deficit | 221 | 157 | 183 | 192 | 176 | 165 | 151 |
| Debt Held by the Public | 1,746 | 1,901 | 2,077 | 2,266 | 2,440 | 2,601 | 2,750 |
| | | | | As a Percent of GNP | | | |
| Revenues | | | | | | | |
| Individual income | 8.3 | 8.9 | 8.3 | 8.4 | 8.6 | 8.7 | 8.9 |
| Corporate income | 1.5 | 1.9 | 2.1 | 2.1 | 2.2 | 2.3 | 2.3 |
| Social insurance | 6.8 | 6.8 | 7.0 | 7.0 | 7.0 | 7.1 | 7.0 |
| Other | 1.7 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 |
| Total | 18.4 | 19.3 | 19.0 | 18.9 | 19.3 | 19.4 | 19.5 |
| Outlays | | | | | | | |
| Defense | 6.5 | 6.4 | 6.2 | 6.1 | 5.9 | 5.8 | 5.7 |
| Entitlements | 10.9 | 10.8 | 10.7 | 10.8 | 10.7 | 10.7 | 10.8 |
| Nondefense discretionary | 4.1 | 3.8 | 4.0 | 3.9 | 3.9 | 3.7 | 3.6 |
| Net interest | 3.2 | 3.1 | 3.2 | 3.2 | 3.2 | 3.1 | 3.0 |
| Offsetting receipts | -1.1 | -1.2 | -1.2 | -1.2 | -1.2 | -1.1 | -1.1 |
| Total | 23.6 | 22.9 | 22.9 | 22.8 | 22.5 | 22.3 | 21.9 |
| Deficit | 5.3 | 3.6 | 3.9 | 3.8 | 3.3 | 2.9 | 2.5 |
| Debt Held by the Public | 41.7 | 43.1 | 44.0 | 45.0 | 45.4 | 45.3 | 44.8 |
| Memorandum: GNP (In billions of dollars) | 4,189 | 4,409 | 4,718 | 5,035 | 5,380 | 5,747 | 6,141 |

SOURCE: Congressional Budget Office.

NOTE: Includes Social Security revenues and outlays, which are off-budget.

a. Actual.

As shown in Table II-6, technical revisions since last February raise estimated revenues by $9 billion to $10 billion a year after 1987. These revisions stem mainly from newly available, detailed data on taxable incomes and taxpayer behavior. No legislation with significant effects on baseline revenues has been enacted since February.

Outlays. The major changes to last winter's outlay projections come from the economic forecast. Higher interest rates account for almost all the upward revision in 1988, and for well over half of the economic reestimates from 1988 through 1992. The remaining economic reestimates mainly reflect higher cost-of-living adjustments (costing a negligible amount in 1988 but $6 billion by 1992) in programs pegged to the Consumer Price Index. Smaller changes reflect adjustments for higher inflation in other programs and, as offsets, greater oil receipts and lower unemployment insurance outlays. Finally, debt service costs rise substantially to reflect the added borrowing necessitated by the other reestimates to revenues and outlays.

TABLE II-5. EFFECT OF THE TAX REFORM ACT OF 1986 ON CBO REVENUE PROJECTIONS (By fiscal year)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|
| | **In Billions of Dollars** | | | | | |
| Baseline Revenues Without Tax Reform | 833 | 909 | 972 | 1,040 | 1,113 | 1,191 |
| Effects of Tax Reform | 20 | -12 | -18 | -5 | 2 | 4 |
| Baseline Revenues | 853 | 897 | 954 | 1,036 | 1,115 | 1,195 |
| | **As a Percent of GNP** | | | | | |
| Baseline Revenues Without Tax Reform | 18.9 | 19.3 | 19.3 | 19.3 | 19.4 | 19.4 |
| Baseline Revenues | 19.3 | 19.0 | 18.9 | 19.3 | 19.4 | 19.5 |

SOURCE: Congressional Budget Office.

TABLE II-6. CHANGES IN CBO BASELINE PROJECTIONS SINCE FEBRUARY 1987 (By fiscal year, in billions of dollars)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|
| **Revenues** | | | | | | |
| Winter Estimate | 834 | 900 | 962 | 1,051 | 1,139 | 1,222 |
| Economic Reestimates | -7 | -12 | -17 | -25 | -32 | -38 |
| Technical Reestimates | 26 | 9 | 9 | 9 | 9 | 10 |
| Enacted Legislation | a/ | a/ | a/ | a/ | a/ | a/ |
| Total | 19 | -3 | -8 | -15 | -24 | -28 |
| Summer Estimate | 853 | 897 | 954 | 1,036 | 1,115 | 1,195 |
| **Outlays** | | | | | | |
| Winter Estimate | 1,010 | 1,071 | 1,126 | 1,188 | 1,248 | 1,306 |
| Economic Reestimates | | | | | | |
| Interest Rates | a/ | 10 | 12 | 13 | 16 | 18 |
| Cost-of-Living Adjustments | a/ | a/ | 3 | 4 | 5 | 6 |
| Debt Service | a/ | 1 | 4 | 7 | 11 | 15 |
| Other | -1 | a/ | a/ | a/ | a/ | -1 |
| Subtotal | -1 | 11 | 19 | 24 | 31 | 38 |
| Technical Reestimates | -2 | -7 | -5 | -6 | -6 | -5 |
| Enacted Legislation | 3 | 2 | 2 | 2 | 2 | 2 |
| Thrift Fund Accounting | 1 | 3 | 3 | 3 | 3 | 3 |
| Total | 1 | 9 | 19 | 24 | 31 | 39 |
| Summer Estimate | 1,010 | 1,080 | 1,146 | 1,212 | 1,280 | 1,345 |
| **Deficit** | | | | | | |
| Winter Estimate | 176 | 171 | 164 | 137 | 110 | 84 |
| Economic Reestimates | 6 | 23 | 35 | 49 | 64 | 77 |
| Technical Reestimates | -28 | -16 | -13 | -16 | -15 | -16 |
| Enacted Legislation | 3 | 2 | 2 | 2 | 2 | 2 |
| Thrift Fund Accounting | 1 | 3 | 3 | 3 | 3 | 3 |
| Total | -18 | 12 | 27 | 39 | 55 | 67 |
| Summer Estimate | 157 | 183 | 192 | 176 | 165 | 151 |

SOURCE: Congressional Budget Office.

NOTE: The winter baseline shown in this table was detailed in *An Analysis of the President's Budgetary Proposals for Fiscal Year 1988* (February 1987).

a. Less than $500 million.

Recently enacted legislation raises outlays by about $2 billion a year, as shown in Table II-6. A supplemental appropriation raises outlays for defense and nondefense agencies. The highway bill enacted in early 1987 reduces outlays in all years below the spending projected last February, by amounts ranging from $400 million in 1988 to $1.9 billion in 1992. Major banking legislation just enacted by the Congress provides the Federal Deposit Insurance Corporation with additional alternatives for assisting troubled institutions. The new law also replenishes the Federal Savings and Loan Insurance Corporation (FSLIC) fund. Although funds received by the FSLIC will be offset over time by greater disbursements, the lag between obligations and disbursements helps to lower the deficit at first. In total, the banking bill reduces the deficit by an estimated $650 million in 1988 and by $1 billion over the entire 1988-1992 period.

A variety of technical reestimates reduce outlays. The largest change occurs in estimates of farm price support programs. Earlier estimates have been revised downward by $3 billion in 1988, and by diminishing amounts in later years, because of expected greater demand (both domestic and foreign), higher prices, and lower production. Other technical revisions reduce outlays in deposit insurance and Social Security compared with previous estimates. Finally, revised treatment of the new thrift savings plan for federal employees, as recommended by the General Accounting Office, adds $3 billion a year in outlays in 1988 through 1992 (see box, pages 54 and 55).

Year-to-Year Changes. The baseline estimates of revenues and outlays yield a federal government deficit that spurts from $157 billion in 1987 to $183 billion in 1988 and $192 billion in 1989. Only after 1989 does the deficit slowly decline.

What explains this irregular pattern? To a large extent, budget totals since 1985 reflect the impact of one-time or transitory policy changes. Adjusting the budget for these changes shows a much less dramatic drop in the deficit between 1986 and 1987, but it also smooths the year-to-year gyrations thereafter.

Table II-7 shows the estimated revenue effects of the 1986 Tax Reform Act compared with prior law. In a complex package that cut both individual and corporate income tax rates while repealing the investment tax credit, lengthening asset lives for depreciation purposes, and curtailing tax preferences, the Congress sought to change the income tax mix even while raising approximately the same revenue as prior law. It basically succeeded in this effort: tax reform is approximately deficit neutral after 1990. But in the first few years, transition rules, changing payment schedules, and taxpayer behavior result in large annual fluctuations. In the

TABLE II-7. EFFECT OF TAX REFORM AND ONE-TIME OUTLAY SAVINGS ON DEFICIT (By fiscal year)

| | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|---|
| **In Billions of Dollars** | | | | | | | |
| CBO Baseline Revenues | 769 | 853 | 897 | 954 | 1,036 | 1,115 | 1,195 |
| Adjustment for Tax Reform | a/ | -20 | 12 | 18 | 5 | -2 | -4 |
| Adjusted Revenues | 769 | 833 | 909 | 972 | 1,040 | 1,113 | 1,191 |
| CBO Baseline Outlays | 990 | 1,010 | 1,080 | 1,146 | 1,212 | 1,280 | 1,345 |
| Adjustments for One-Time Savings: | | | | | | | |
| Due to asset sales and loan prepayments | a/ | 7 | a/ | -1 | -1 | -1 | -1 |
| Due to timing shifts | -1 | 5 | a/ | a/ | a/ | a/ | a/ |
| Other | 3 | 2 | -3 | -1 | a/ | a/ | a/ |
| Subtotal | 2 | 15 | -2 | -2 | -1 | -1 | -1 |
| Adjusted Outlays | 992 | 1,025 | 1,078 | 1,144 | 1,211 | 1,279 | 1,344 |
| CBO Baseline Deficit | 221 | 157 | 183 | 192 | 176 | 165 | 151 |
| Adjustments | 2 | 35 | -14 | -20 | -6 | 1 | 3 |
| Adjusted Deficit | 223 | 192 | 169 | 172 | 170 | 166 | 154 |
| **Adjusted Revenues, Outlays, and Deficit as a Percent of GNP** | | | | | | | |
| Revenues | 18.4 | 18.9 | 19.3 | 19.3 | 19.3 | 19.4 | 19.4 |
| Outlays | 23.7 | 23.3 | 22.8 | 22.7 | 22.5 | 22.2 | 21.9 |
| Deficit | 5.3 | 4.4 | 3.6 | 3.4 | 3.2 | 2.9 | 2.5 |

SOURCE: Congressional Budget Office.

a. Less than $500 million.

## THE FEDERAL EMPLOYEES' THRIFT PLAN AND THE BUDGET

As part of a comprehensive retirement reform package affecting federal employees, the Congress in 1986 set up a new thrift plan to collect voluntary contributions from workers and matching contributions from their agencies. The thrift plan is similar to voluntary salary reduction plans (often called 401 (k) plans) that cover many private sector workers. Participants in such plans enjoy certain tax advantages--primarily by deferring taxes on voluntary contributions, matching contributions, and investment earnings. The first contributions flowed into the new plan in early 1987. By June 30, the fund held $400 million and was growing rapidly.

In establishing a Federal Retirement Thrift Investment Board to administer the new fund, the Congress emphasized that the government's role is purely fiduciary. The fund's assets belong to the participants. But despite its emphasis on the government's limited role, the Congress included the fund's receipts and expenditures in the budget, based on guidance received at that time from CBO and the Office of Management and Budget.

In a letter to a Member of Congress last May, the General Accounting Office (GAO) argued that the thrift fund's receipts and expenditures should not be treated in the budget like those of other agencies. Citing the clear legislative history, the GAO concluded that it is inappropriate for the budget to include monies held strictly in trust for individual workers.

The CBO has followed the GAO's recommendation in its new budget projections. By emphasizing that the thrift fund is not a part of the government, the new treatment changes the classification of four transactions, as shown in the accompanying illustration. Voluntary employee contributions would no longer reduce the deficit, reflecting merely the private investment choices of federal workers. Agency contributions--currently labeled intragovernmental--would instead represent a payment by government to private savers. Similarly, interest paid by the Treasury to the fund is a payment by the government to outsiders. Finally, outlays by the thrift fund would not contribute to the deficit. At present, the fund's outlays for benefit payments, purchase of nongovernment securities, and administrative costs are counted in the budget. But in the proposed approach, these transactions take place among private parties and are not relevant to the government's deficit.

Even while raising the deficit, the new thrift plan treatment has no effect on the federal government's credit demands. The thrift fund will purchase significant amounts of Treasury securities and, over time, of corporate securities as well.

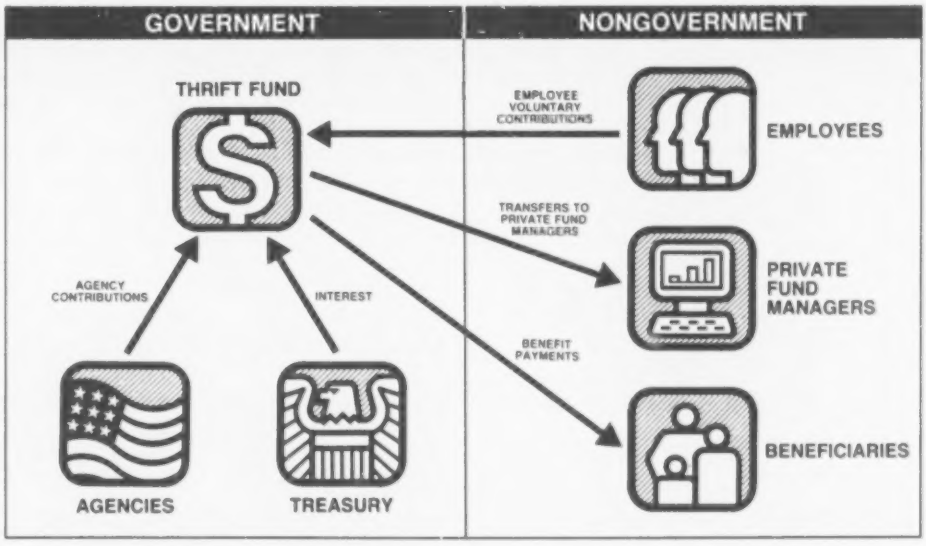
### CHANGE FROM PREVIOUS BUDGETARY TREATMENT

(In billions of dollars)

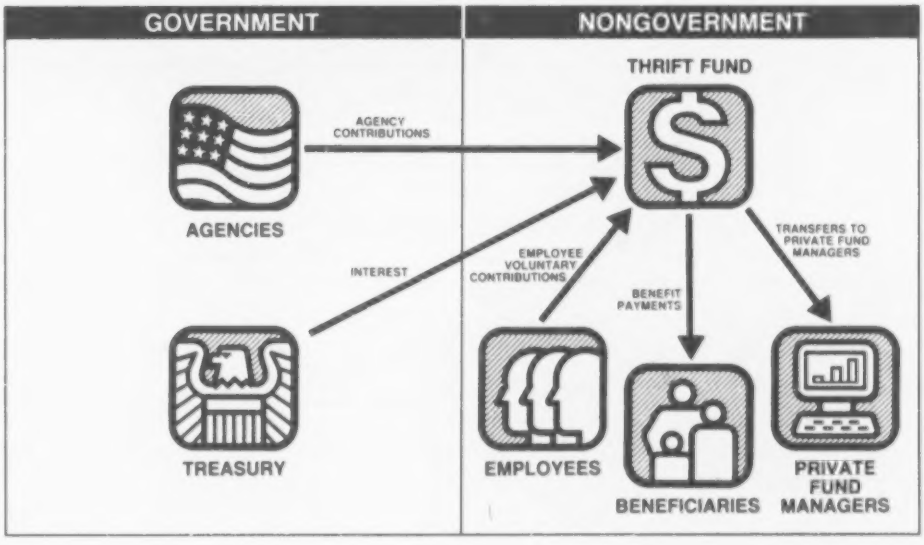
| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|
| Employee Voluntary Contributions | 0.5 | 1.8 | 2.0 | 2.1 | 2.2 | 2.3 |
| Agency Contributions | 0.6 | 1.4 | 1.6 | 1.8 | 1.9 | 2.1 |
| Interest Paid by the Government | a/ | 0.2 | 0.4 | 0.6 | 0.9 | 1.1 |
| Outlays by the Thrift Fund | a/ | -0.3 | -0.7 | -1.1 | -1.6 | -2.0 |
| Total Increase in Deficit | 1.0 | 3.1 | 3.3 | 3.4 | 3.4 | 3.5 |

a. Less than $50 million.

## Old Treatment of Thrift Plan




## New Treatment of Thrift Plan



absence of tax reform, federal revenues would be about 18.9 percent of GNP in 1987 and 19.3 percent to 19.4 percent in 1988 through 1992.

Table II-7 also shows unusual, one-time factors affecting outlays in three categories. Asset sales and loan prepayments primarily include sales mandated in the reconciliation bill enacted in fall 1986. Timing shifts reflect the movement of outlays by a few days or weeks between adjacent fiscal years. The government reduced 1987 outlays by accelerating the final payment for general revenue sharing into September 1986, and by delaying military paychecks and certain Medicare payments into 1988. Other one-time factors include the accelerated release of Outer Continental Shelf escrow funds in 1986 and 1987. Without the year-to-year fluctuations shown in the table, projected outlays would decline slowly but steadily as a percent of GNP from 1986 through 1992.

Adjusting the baseline estimates for both tax reform and one-time outlay savings reveals a slow but steady drop in the deficit as a share of GNP from 1987 on. The 1987 deficit improvement looks more modest; the 1988 and 1989 outlooks more favorable.

Sensitivity of the Estimates. Economic conditions vitally affect the federal budget. Wages and salaries, corporate profits, and other economic variables largely determine the federal government's revenues. Outlays for many benefit programs depend on the inflation and unemployment rates, and interest rates--notoriously difficult to forecast--affect the government's cost of servicing its debt of nearly $2 trillion.

As discussed in Chapter I, the forecast assumes that real economic growth will average about 2.7 percent over the next five years. Lowering the assumption for real growth by one percentage point each year, and taking into account the accompanying higher unemployment, would lead to a hike in the deficit forecast of about $9 billion in 1988 and $84 billion by 1992. Raising the assumptions about interest rates for all maturities by one percentage point in every year would cause interest outlays to be about $5 billion higher in 1988 and $24 billion higher by 1992. An earlier report, *The Economic and Budget Outlook: Fiscal Years 1988-1992*, contains fuller descriptions and estimates of how these and other economic variables affect the federal budget.

## The Congressional Budget Resolution

The policies of the Congressional budget resolution, if fully implemented, would reduce the deficit according to CBO estimates to about $146 billion in

1988, $140 billion in 1989, and $108 billion in 1990 (Table II-8). The budget resolution specifies policies for three years only. Over these three years, deficits average about $52 billion a year less than in the baseline. About one-half of the deficit reduction comes from revenue increases that were assumed--but not specified in detail--in the resolution. Another 20 percent comes from reducing growth in defense budget authority below the rate of inflation. Because actual defense outlays respond with a lag to changes in appropriations, defense outlays are only $2 billion below the baseline in 1988 but $19 billion lower in 1990. (The resolution allows even less defense

TABLE II-8. POLICY CHANGES IN THE FISCAL YEAR 1988 BUDGET RESOLUTION AS ESTIMATED BY CBO
(By fiscal year, in billions of dollars)

| | 1988 | 1989 | 1990 |
|---|---|---|---|
| CBO Baseline Deficit | 183 | 192 | 176 |
| Policy Changes | | | |
| Revenue increases a/ | -21 | -25 | -26 |
| Defense | -2 | -12 | -19 |
| Nondefense discretionary | -4 | -6 | -8 |
| Entitlements | -3 | -5 | -7 |
| Offsetting receipts | -1 | b/ | 1 |
| Rural Electrification Administration prepayments | -5 | 1 | 1 |
| Debt service | -1 | -5 | -9 |
| Total | -37 | -52 | -68 |
| Budget Resolution as Estimated by CBO | 146 | 140 | 108 |

SOURCE: Congressional Budget Office.

a. Revenue increases appear as negative numbers because they reduce the deficit.

b. Less than $500 million.

growth in the absence of revenue increases and other reconciliation measures.) The remaining deficit reductions are spread among nondefense discretionary programs, entitlements (especially agriculture and Medicare), and savings on debt service costs.

Reestimates to the Budget Resolution. Table II-9 shows the CBO reestimates to the deficits in the budget resolution. In its report on the budget resolution, the Congress displayed the resolution's targets in two ways--one using the economic and technical assumptions of the President's February budget, and the other using CBO's assumptions of last winter. Deficits were

TABLE II-9. CBO REESTIMATES OF CONGRESSIONAL BUDGET RESOLUTION (By fiscal year, in billions of dollars)

| | 1988 | 1989 | 1990 |
|---|---|---|---|
| Budget Resolution Under CBO Winter Assumptions | | | |
| Revenues | 922 | 987 | 1,077 |
| Outlays | 1,055 | 1,102 | 1,149 |
| Deficit | 134 | 115 | 72 |
| CBO Reestimates to Budget Resolution Deficit | | | |
| Economic reestimates | 23 | 34 | 47 |
| Technical reestimates | -13 | -12 | -14 |
| Enacted legislation | -1 | a/ | a/ |
| Thrift fund accounting | 3 | 3 | 3 |
| Total reestimates | 12 | 25 | 36 |
| Reestimate of Budget Resolution | | | |
| Revenues | 918 | 979 | 1,062 |
| Outlays | 1,064 | 1,119 | 1,170 |
| Deficit | 146 | 140 | 108 |

SOURCE: Congressional Budget Office.

a. Less than $500 million.

higher under the latter assumptions, and these higher deficits ($134 billion in 1988, $115 billion in 1989, and $72 billion in 1990) are shown as the starting point in Table II-9. Reestimates to the budget resolution, and the accounting adjustment for the federal employees' thrift fund, differ little from the economic and technical updates already described for the baseline, with two major exceptions. First, technical reestimates to the resolution reflect new assumptions about proceeds from prepayment of certain Rural Electrification Administration (REA) loans in 1988. The budget resolution assumed that $7 billion would be generated by this route, through legislation permitting borrowers to prepay without penalty their high-interest REA loans extended by the federal government (refinancing the loans through private lenders). But because of higher interest rates, the prepayment provisions--if implemented--are likely to generate only $5 billion in 1988. The other significant difference involves legislative reestimates. Table II-9 includes no legislative reestimates other than the recently enacted bill that recapitalizes the Federal Savings and Loan Insurance Corporation fund. Other recently enacted legislation (for example, the highway bill) was already assumed in the budget resolution or--in the case of the supplemental appropriation bill--comes under binding appropriation ceilings in the resolution.

The budget resolution sets broad priorities for the allocation of federal government spending, assigning Congressional committees to find specific savings in the areas under their jurisdictions. In this analysis of the budget resolution, these savings are treated as targets to be attained through further action. The savings are not reestimated even where they deviate from what would be expected on the basis of assumed appropriations and historical spending patterns.

## Federal Sector of the National Income and Product Accounts

Both the budget and the federal sector of the National Income and Product Accounts (NIPA) measure the receipts and expenditures of the federal government. The NIPA federal sector, however, is designed to be more useful than the budget in analyzing the macroeconomic impact of federal government activity. NIPA receipts reflect income of the federal government from various sources, including individual and corporate income taxes, social insurance contributions, indirect business taxes, as well as various fees and payments that are not counted as unified budget revenues. By describing the destination of federal spending--for example, the purchase of goods and services, transfer payments, or grants to state and local governments--the NIPA categories of federal expenditures help economists to trace the impact of the government on final demand and production.

The NIPA estimates of federal government activity differ from the budget in their treatment of certain offsetting receipts, timing adjustments, treatment of lending and financial activities, and coverage. Table II-10 shows estimates of federal-sector receipts on a NIPA basis consistent with CBO's new baseline projections.

Certain payments that appear as offsets to outlays in the budget are instead treated as receipts in the federal sector of the NIPA. By far the largest such payment is contributions by federal government agencies to employee retirement. Other such netting and grossing adjustments apply to payments that reflect voluntary or business-type transactions, such as the supplemental premiums paid by many Medicare participants. Financial transactions, such as bonuses on Outer Continental Shelf land leases, lending, and asset sales, are excluded from the NIPA federal sector, as are transactions involving Puerto Rico and other territories.

The two most important timing differences affect defense spending and taxes on corporate profits. The budget records taxes on corporate profits when payments are made, while the NIPA records them when the liability accrues. Also, NIPA defense purchases reflect the delivery of completed products, while the budget shows payments to contractors (including payments for work in progress).

Differences between the budget and the federal sector of the NIPA are detailed in Table II-11. These adjustments have changed somewhat from those published last February. That earlier report highlighted the different treatment of the new federal workers' thrift fund in the budget and in the NIPA, noting that the NIPA would treat the new plan as part of private savings (just as it treats similar plans in the private sector and state and local governments). The new handling of the thrift plan brings the budgetary treatment close to the NIPA. Last February's report also stated that the delay of military paychecks from September to October 1987 would contribute to the defense timing adjustment, leaving NIPA defense purchases impervious to the few days' delay. Instead, it appears that the Commerce Department will place the savings in a separate reconciliation account (wage accruals less disbursements); thus, defense purchases in the third quarter of 1987 will be lowered by the delay.

TABLE II-10. PROJECTIONS OF CBO BASELINE RECEIPTS AND EXPENDITURES ON A NATIONAL INCOME AND PRODUCT ACCOUNTS BASIS (By fiscal year, in billions of dollars)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|
| Receipts | | | | | | |
| Personal tax and nontax receipts | 396 | 401 | 429 | 468 | 508 | 550 |
| Corporate profits tax accruals | 101 | 112 | 125 | 141 | 147 | 156 |
| Indirect business tax and nontax accruals | 53 | 54 | 55 | 56 | 58 | 60 |
| Contributions for social insurance | 343 | 378 | 404 | 434 | 466 | 495 |
| Total | 892 | 945 | 1,012 | 1,099 | 1,180 | 1,261 |
| Expenditures | | | | | | |
| Purchases of goods and services | 372 | 390 | 409 | 430 | 449 | 469 |
| Defense | 288 | 295 | 308 | 323 | 338 | 353 |
| Nondefense | 84 | 95 | 101 | 107 | 111 | 116 |
| Transfer payments | 409 | 440 | 475 | 513 | 550 | 591 |
| Grants to state and local governments | 104 | 110 | 116 | 121 | 127 | 133 |
| Net interest | 139 | 151 | 161 | 170 | 179 | 183 |
| Subsidies less current surplus of government enterprises | 33 | 34 | 32 | 35 | 34 | 32 |
| Total | 1,057 | 1,124 | 1,194 | 1,268 | 1,339 | 1,408 |
| Deficit | 164 | 179 | 182 | 169 | 159 | 147 |

SOURCE: Congressional Budget Office.

TABLE II-11. RELATIONSHIP OF THE CBO BASELINE TO THE FEDERAL SECTOR OF THE NATIONAL INCOME AND PRODUCT ACCOUNTS (By fiscal year, in billions of dollars)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|
| **Receipts** | | | | | | |
| Total Revenues a/ | 853 | 897 | 954 | 1,036 | 1,115 | 1,195 |
| Contributions for Employee Retirement | 35 | 40 | 43 | 46 | 49 | 53 |
| Medicare Premiums | 7 | 8 | 9 | 10 | 10 | 11 |
| Other Netting and Grossing | 8 | 9 | 9 | 9 | 10 | 9 |
| Geographic Exclusions | -3 | -3 | -3 | -3 | -3 | -3 |
| Other | -8 | -7 | -1 | 1 | -2 | -4 |
| Federal Sector NIPA Receipts | 892 | 945 | 1,012 | 1,099 | 1,180 | 1,261 |
| **Expenditures** | | | | | | |
| Total Outlays a/ | 1,010 | 1,080 | 1,146 | 1,212 | 1,280 | 1,345 |
| Lending and Financial Transactions | -4 | -7 | -9 | -6 | -4 | -4 |
| Contributions for Employee Retirement | 35 | 40 | 43 | 46 | 49 | 53 |
| Medicare Premiums | 7 | 8 | 9 | 10 | 10 | 11 |
| Other Netting and Grossing | 8 | 9 | 9 | 9 | 10 | 9 |
| Defense Timing Adjustment | 7 | 3 | 3 | 3 | 3 | 3 |
| Bonuses on Outer Continental Shelf Land Leases | 1 | 1 | b/ | b/ | b/ | b/ |
| Geographic Exclusions | -6 | -6 | -6 | -7 | -7 | -7 |
| Other | -2 | -4 | -2 | b/ | -2 | -3 |
| Federal Sector NIPA Expenditures | 1,057 | 1,124 | 1,194 | 1,268 | 1,339 | 1,408 |

SOURCE: Congressional Budget Office.

a. Includes Social Security, which is off-budget.

b. Less than $500 million.

CHAPTER III

# UNCERTAINTY AND BIAS IN BUDGET PROJECTIONS

Large deficits and statutory deficit targets have heightened concerns about the uncertainty of budget projections. The Grassley amendment to the Deficit Reduction Act of 1984 directed the Congressional Budget Office (CBO) to study the reliability of the budget resolution estimates. The situation that led to this amendment arose again in 1987, after lawmakers who had concluded the 99th Congress believing they had met the goals of the Balanced Budget Act returned in January to find that the deficit estimate had risen again.

These concerns have prompted the present chapter, which reviews the accuracy of Congressional budget estimates and CBO economic forecasts during the 1980s. For the reader who wants a quick overview of the findings, the first section summarizes the analysis. The following sections describe and quantify the sources of error in budget resolution estimates in more detail. The chapter concludes with a discussion of the range of uncertainty in deficit estimates.

## OVERVIEW

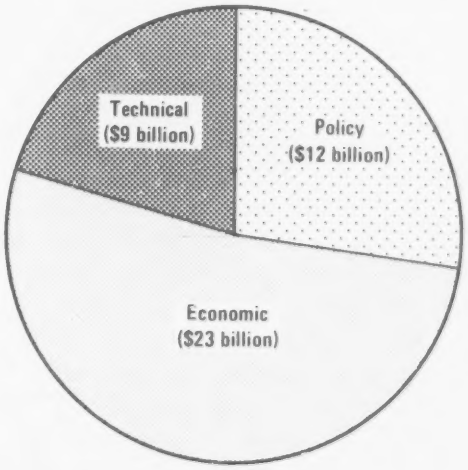
Congressional budget resolutions during the 1980s have underestimated the actual deficits by an average of $44 billion--about 6 percent of outlays or 7 percent of revenues. Every year the deficit exceeded the budget resolution target, with errors as large as $91 billion in fiscal year 1983 and as small as $4 billion the following year. The deficit underestimate for 1987, with 45 days of the current fiscal year remaining, appears to be about $15 billion; but as recently as 1986 the underestimate was $49 billion. Policy differences, inaccurate economic assumptions, and inaccurate technical estimating methods have all contributed to the deficit errors, as shown in Figure III-1 on the next page.

The budget resolution is a plan for guiding subsequent tax and spending decisions. Policy differences--failure to implement policies assumed in the budget resolutions--have played a role in increasing the deficit in six out of the last eight years. The average policy difference of $12 billion is accounted for by higher spending. In the early 1980s, the bulk of the spending overruns were in defense and nondefense discretionary appropriations. In later years, higher entitlement spending and lower offsetting receipts have been the major factors.

Inaccurate economic assumptions have been the greatest source of error in the deficit estimates. For example, when the budget resolution estimate of the gross national product (GNP) is too high, revenues are overestimated and the deficit underestimated. During the 1980s, errors in forecasting GNP and other economic variables have been responsible for underestimating the deficit by $23 billion per year. In 1982 and 1986, the budget resolution conferees used economic assumptions more optimistic than those of CBO. Had they used CBO economic assumptions, the average error would have been somewhat less--$20 billion--but still large. There are two major reasons for these economic errors:

Figure III-1.

## Sources of Error in Deficit Estimates, Fiscal Years 1980-1987




SOURCE: Congressional Budget Office.

- Disappointing Economic Performance. The trend growth in productivity and GNP has slowed during the 1980s, as discussed in Appendix B and in previous CBO reports. Any forecast that used the past as a guide to the future would therefore seem optimistic in retrospect. In fact, all major forecasters systematically overestimated GNP during the 1980s, although by slightly less than CBO. Mechanical time-series forecasts, which extrapolate past trends and cycles, would have tended to be even more optimistic than CBO. About $13 billion of the average deficit underestimate can be attributed to overestimating GNP.

- Unpredictable Components. Most of the remaining economic errors involve macroeconomic variables that are notoriously hard to predict. Overestimates of oil prices, for example, led to overestimates of windfall profit tax receipts averaging $4 billion. Since the windfall profit tax no longer produces significant revenues, this particular source of error should not recur. Overestimates of the corporate income tax base have been responsible for deficit errors of $5 billion, above and beyond the errors resulting from misestimating GNP. Errors in forecasting interest rates have caused large errors in the deficit estimates in certain years, but their average contribution has been small--that is, interest rates have been overestimated as often as they have been underestimated.

Errors in technical estimating assumptions--all of the errors that cannot be attributed to policy differences or inaccurate economic assumptions--are the smallest of the three sources of error, averaging $9 billion per year during the 1980s. Outlay estimates for farm price supports have been responsible for half of the technical errors, and errors in corporate income tax receipts for one-quarter. Apart from these two items, technical errors have generally been small and random.

CBO is carefully reviewing its estimating procedures in an attempt to minimize the economic and technical estimating errors identified in this analysis. Nevertheless, given the present size and variability of the American economy, budget deficits can never be forecast perfectly. A measure of the variability of the deficit estimate resulting from economic factors, the standard error, ranges from $36 billion to $44 billion. This means that the estimated deficit will differ by no more than $36 billion to $44 billion from the actual outcome about two-thirds of the time.

## ANALYSIS OF BUDGET RESOLUTION ESTIMATES

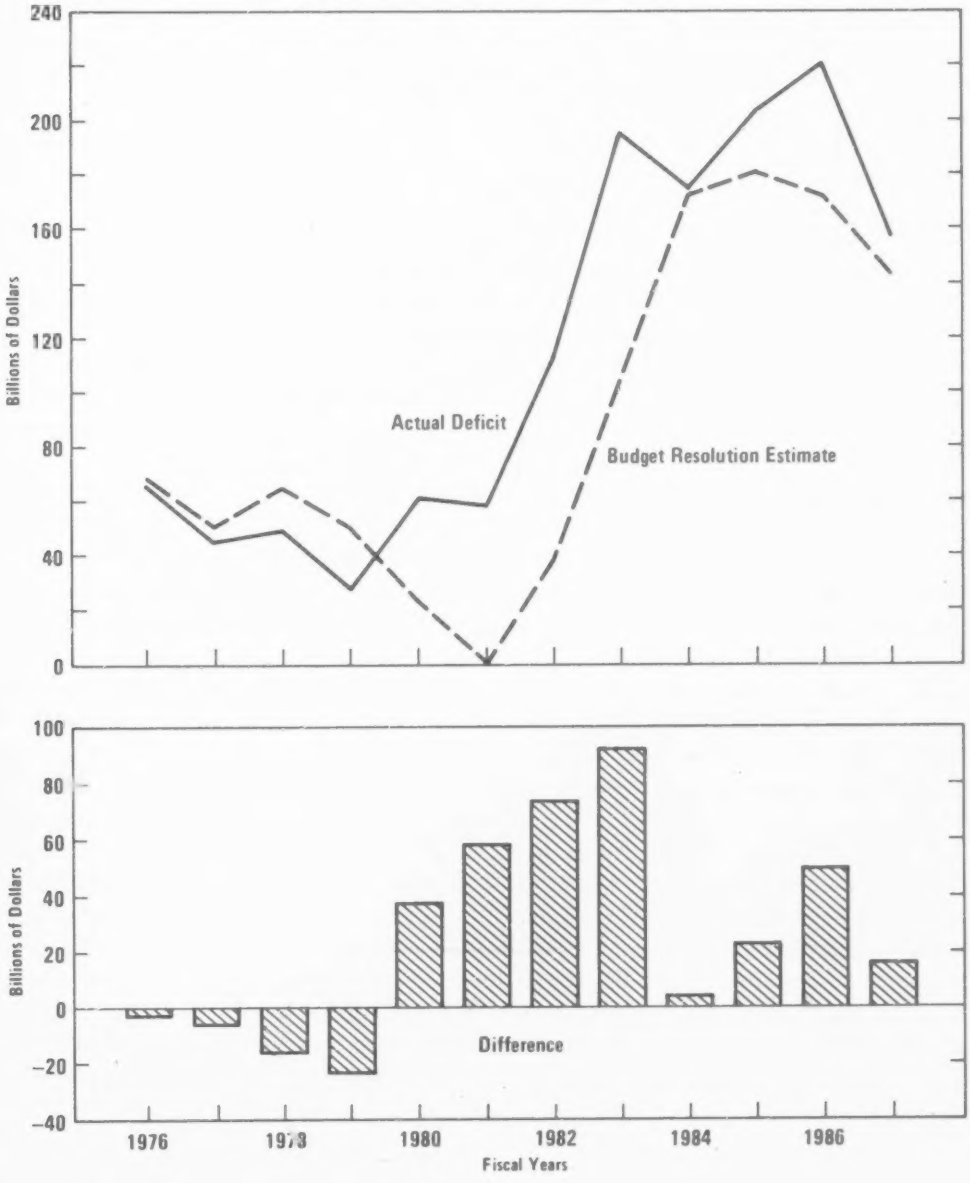
The uncertainty of budget projections has often frustrated Congressional attempts to cut the deficit. The level of frustration has been particularly high this year, as the Congress has struggled to meet the Balanced Budget Act's $144 billion target in the face of seesawing budget estimates. Estimates of the 1987 deficit swung from $143 billion in June 1986 to $161 billion in August, $151 billion in October, and $176 billion in February 1987.

The escalation of $33 billion in the deficit estimate in only eight months raised serious questions about the quality of the deficit projections. Critics contended that CBO had consistently erred on the side of optimism, and that the latest estimate was also too optimistic. Halfway into the fiscal year, many private-sector forecasters were projecting a 1987 deficit in the vicinity of $200 billion. While unexpected strength in tax collections has since reduced the deficit estimate to $157 billion and has muted the charges of bias, this chronicle provides further evidence of the uncertainty of the deficit estimates.

The concern over the accuracy of budget projections is not new. Soon after the Congressional budget process began, Senators Edmund Muskie and Henry Bellmon requested CBO to determine the reasons for the shortfall in federal budget outlays below the levels specified in the Congressional budget resolutions for 1977 and 1978. More recently, section 2905 (known as the Grassley Amendment) of the Deficit Reduction Act of 1984 (Public Law 98-369) directed CBO to study the nature and reliability of the assumptions upon which budget resolution estimates are based.

The first (and, since fiscal year 1986, the only) Congressional budget resolution is adopted in late spring or early summer. It is generally based on economic forecasts made the previous winter. The resolution is a plan for guiding spending and taxing decisions for the fiscal year beginning the next October. Subsequent authorization and appropriation action is required to turn the plan into law. In fiscal years 1976 through 1979, the actual deficit at the end of the year turned out to be less than the first budget resolution estimate. Since 1980, however, the actual deficit has consistently exceeded the planned amount. (See Figure III-2.)

Figure III-2.
## Budget Resolution and Actual Deficits




SOURCE: Congressional Budget Office.

The budget resolution estimates are predicated on three types of assumptions:

- Policy assumptions, which specify the laws and administrative practices that are expected to apply--for some programs, those currently in force; for others, some proposed departure.

- Economic assumptions affecting revenues and spending; these include dozens of variables, but most importantly income and employment, inflation, and interest rates.

- Technical assumptions, which encompass all the remaining statistical and judgmental techniques used to turn the policy and economic assumptions into budget estimates.

Table III-1 divides the differences between the budget resolution estimates for fiscal years 1980-1987 and the actual outcomes into those resulting from policy, economic, and technical assumptions. The actual budget totals have been adjusted where necessary to agree with the budgetary treatment of various items in the budget resolutions (see Appendix A). Differences in debt-service costs, which are not directly controllable, are attributed to the three sources of error in proportion to each one's contribution to the deficit misestimate. All figures in the table are CBO staff estimates based on Budget Committee reports and other information. The analysis for 1987 is preliminary and is based on CBO's current estimates of revenues, outlays, and the deficit; the actual figures will not be known for another two months. No detailed analyses of first budget resolutions are available for fiscal years 1976-1979, because in those years more attention was given to the second budget resolutions.

Policy, economic, and technical assumptions have all contributed to recent underestimates of the deficit, as Table III-1 shows. Over the past eight years, the deficit has exceeded the budget resolution estimate by an average of $44 billion. Of this amount, $12 billion resulted from policy differences, $23 billion from inaccurate economic assumptions, and $9 billion from inaccurate technical assumptions. The average difference may be considered a measure of bias. A positive or negative average difference indicates that the actual outcome tended to exceed or fall short of the budget resolution estimate.

Another summary measure of accuracy is the average absolute difference between estimates and outcomes (the average of the dollar errors ignoring whether the errors were positive or negative). This is a measure of uncertainty. It shows the average annual amount of error, regardless of

direction, resulting from each source of difference. The total average absolute difference is usually less than the sum of the component parts, because the individual differences in any year may not all be in the same direction and thus may partly offset each other. The average absolute difference in deficit estimates resulting from policy assumptions was $18 billion, that

TABLE III-1. SOURCES OF DIFFERENCES BETWEEN ACTUAL BUDGET TOTALS AND FIRST BUDGET RESOLUTION ESTIMATES FOR FISCAL YEARS 1980-1987 (In billions of dollars)

| | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 a/ | Average Difference | Average Absolute Difference |
|---|---|---|---|---|---|---|---|---|---|---|
| **Revenues** | | | | | | | | | | |
| Policy Assumptions | 6.2 | -3.7 | 13.0 | -4.6 | -13.7 | -0.2 | -1.5 | 19.2 | 1.8 | 7.7 |
| Economic Assumptions | 8.4 | 5.0 | -51.9 | -58.0 | 4.5 | -20.0 | -23.0 | -29.3 | -20.5 | 25.0 |
| Technical Assumptions | -3.5 | -12.6 | -1.1 | -2.7 | -3.9 | 3.3 | -2.1 | 10.7 | -1.5 | 5.0 |
| Total Differences | 11.1 | -11.2 | -40.0 | -65.3 | -13.1 | -16.8 | -26.6 | 0.5 | -20.2 | 23.1 |
| **Outlays** | | | | | | | | | | |
| Policy Assumptions | 19.6 | 24.5 | 1.2 | 17.6 | 1.5 | 22.8 | 14.2 | 6.8 | 13.5 | 13.5 |
| Economic Assumptions | 12.4 | 6.4 | 24.1 | 0.5 | 7.1 | -5.2 | -12.1 | -12.2 | 2.6 | 10.0 |
| Technical Assumptions | 15.6 | 16.0 | 7.7 | 8.1 | -18.0 | -12.9 | 20.1 | 20.8 | 7.2 | 14.9 |
| Total Differences | 47.6 | 46.9 | 32.9 | 26.2 | -9.4 | 4.8 | 22.2 | 15.4 | 23.3 | 25.7 |
| **Deficit** | | | | | | | | | | |
| Policy Assumptions | 13.4 | 28.2 | -11.8 | 22.2 | 15.2 | 23.0 | 15.7 | -12.4 | 11.7 | 17.7 |
| Economic Assumptions | 4.0 | 1.4 | 76.0 | 58.5 | 2.7 | 14.8 | 10.9 | 17.1 | 23.2 | 23.2 |
| Technical Assumptions | 19.1 | 28.6 | 8.8 | 10.8 | -14.1 | -16.2 | 22.2 | 10.2 | 8.7 | 16.2 |
| Total Differences | 36.6 | 58.1 | 73.0 | 91.5 | 3.7 | 21.6 | 48.8 | 14.8 | 43.5 | 43.5 |

SOURCE: Congressional Budget Office. For the Congressional budget resolution estimates and actual budget totals, see Appendix A.

a. The figures for 1987 are preliminary and are based on CBO's current estimates of revenues, outlays, and the deficit.

resulting from economic assumptions $23 billion, and that resulting from technical assumptions $16 billion. The next three sections of the chapter more thoroughly explore the three sources of error.

## POLICY DIFFERENCES

Policy differences are not the main focus of this chapter, because they do not represent deficiencies in economic forecasting or budget estimating. In drafting a budget resolution, the Budget Committees must make assumptions about the timing and likely effects of future tax legislation, spending proposals, and administrative procedures. If the laws enacted differ from those assumed, the resolution estimates will be inaccurate. To a much lesser extent, unanticipated regulatory and other administrative actions by federal agencies can also cause unexpected changes in spending. Legislative and administrative actions have consistently increased the deficit relative to that assumed in the budget resolution (see Table III-2).

Over the past eight years, on average, actual tax policies have differed from those assumed in the budget resolutions by less than $2 billion, although there have been notable differences in a few years. In 1982, the Economic Recovery Tax Act cut taxes $13 billion less than assumed, leading to higher-than-projected revenues. In 1984, on the other hand, revenues fell $14 billion short of the level assumed, because of delays in enacting what was to become the Deficit Reduction Act. The 1987 budget resolution assumed revenue increases of $5.9 billion above existing law. Actual tax increases totaled $25.1 billion, exceeding the assumption by $19.2 billion. This excess resulted from the Tax Reform Act, which was not assumed in the 1987 budget resolution. The remaining revenue increases resulted primarily from improving tax enforcement activities, extending Superfund taxes, and speeding up certain excise tax payments.

Differences in spending policies have caused outlays to exceed the targets by an average of $14 billion. In two years (1982 and 1984) the amount of additional spending was $2 billion or less. But in two other years (1981 and 1985) the increase was more than $20 billion. The reasons for overspending have varied from year to year. In 1980 and 1981, the bulk of the increases were in defense and nondefense discretionary spending, which are subject to the annual appropriation process. Subsequently, the overruns have resulted primarily from underestimates of the spending implications of new entitlement laws, such as farm price supports. In addition lower offsetting receipts were realized because of failed legislative initiatives and unexpected administrative actions. Of the $23 billion in extra spending in

TABLE III-2. POLICY DIFFERENCES BETWEEN ACTUAL BUDGET TOTALS AND FIRST BUDGET RESOLUTION ESTIMATES FOR FISCAL YEARS 1980-1987
(In billions of dollars)

| | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987[a] | Average Difference | Average Absolute Difference |
|---|---|---|---|---|---|---|---|---|---|---|
| Revenues | 6.2 | -3.7 | 13.0 | -4.6 | -13.7 | -0.2 | -1.5 | 19.2 | 1.8 | 7.7 |
| Outlays | | | | | | | | | | |
| National defense | 5.9 | 4.5 | -3.9 | 2.6 | -0.7 | 0.9 | -0.8 | 0.7 | 1.2 | 2.5 |
| Entitlements | | | | | | | | | | |
| Farm price supports | 0.8 | 0.3 | -1.7 | 1.7 | -- | 2.6 | 5.8 | 3.3 | 1.6 | 2.0 |
| Medicare | 1.8 | 1.3 | -0.1 | 1.6 | 0.3 | -- | 0.4 | -1.6 | 0.5 | 0.9 |
| Social Security | -1.3 | -0.2 | 5.1 | -0.4 | -- | -0.1 | -- | -- | 0.4 | 0.9 |
| Unemployment compensation | 1.8 | 1.4 | -- | 5.9 | 1.3 | 0.2 | -0.1 | [b] | 1.3 | 1.3 |
| Public housing financing | -- | -- | -- | -- | 1.0 | 13.9 | 0.9 | -- | 2.0 | 2.0 |
| Means-tested programs | 1.8 | 0.8 | -0.1 | 1.1 | -0.3 | -- | -0.3 | [b] | 0.4 | 0.6 |
| Other | 0.1 | 3.5 | -0.2 | [b] | 0.3 | 0.2 | 0.1 | 0.7 | 0.6 | 0.6 |
| Subtotal | 6.9 | 7.1 | 3.1 | 9.9 | 2.7 | 16.8 | 6.8 | 2.5 | 7.0 | 7.0 |
| Nondefense discretionary | 5.8 | 9.9 | 1.1 | 5.7 | -2.0 | 1.2 | 2.3 | 2.4 | 3.3 | 3.8 |
| Net interest | | | | | | | | | | |
| Debt service | 0.8 | 2.3 | -1.7 | 1.0 | 0.7 | 1.2 | 0.9 | -0.4 | 0.6 | 1.1 |
| Other | -- | 0.4 | 0.9 | -3.2 | [b] | [b] | -1.7 | -- | -0.4 | 0.8 |
| Subtotal | 0.8 | 2.7 | -0.8 | -2.2 | 0.7 | 1.3 | -0.9 | -0.4 | 0.1 | 1.2 |
| Offsetting receipts | 0.1 | 0.3 | 1.7 | 1.6 | 0.8 | 2.6 | 6.7 | 1.5 | 1.9 | 1.9 |
| Total | 19.6 | 24.5 | 1.2 | 17.6 | 1.5 | 22.8 | 14.2 | 6.8 | 13.5 | 13.5 |
| Deficit | 13.4 | 28.2 | -11.8 | 22.2 | 15.2 | 23.0 | 15.7 | -12.4 | 11.7 | 17.7 |

SOURCE: Congressional Budget Office

a. The figures for 1987 are preliminary.
b. Less than $50 million.

1985, for example, about $14 billion was contributed by the government's purchase of federally guaranteed public housing authority notes, whose tax-exempt status was called into question by the Deficit Reduction Act of 1984. Another $3 billion resulted from unanticipated administrative action to make advance deficiency payments to farmers on their 1985 crops. Farm price supports also contributed $6 billion of the $14 billion in extra spending in 1986, as the Food Security Act of 1985 cost more than the legislation assumed in the budget resolution. In addition, offsetting receipts fell $7 billion short, because legislation to release disputed Outer Continental Shelf funds produced less in additional receipts than assumed, and bills to obtain oil overcharge funds and sell Conrail were not enacted.

In 1987, policy differences from the budget resolution added $6.8 billion to outlays. National defense and nondefense discretionary spending together exceeded the budget resolution by $3.1 billion. Changes in entitlement programs increased outlays by $2.5 billion on balance. Administrative changes in the farm price support program--primarily instituting a paid land diversion program for feed grains and making some payments in generic crop certificates--added $3.3 billion, while Medicare legislation saved $1.6 billion more than the resolution assumed. Lower offsetting receipts contributed $1.5 billion to the increase in outlays, primarily because of the failure to recoup from the states $1.2 billion in oil overcharge funds. Finally, by reducing the deficit, policy actions in 1987 cut debt-service costs by $0.4 billion.

## ERRORS IN ECONOMIC ASSUMPTIONS

Federal budget outlays and revenues are tied closely to the state of the economy. The overall level of economic activity and the shares of income going to various sectors--wages and salaries, corporate profits, and proprietors' and interest income--largely determine the revenue collected by the federal government. Spending for benefit programs such as unemployment compensation and Social Security is affected by the rates of unemployment and inflation. The burgeoning federal debt means that assumptions about interest rates are now more critical than ever before in federal budget projections.

### Budget Resolution Economic Assumptions

The Congressional Budget Act requires that the conference report on the budget resolution set forth the economic assumptions upon which it is based.

Normally, the conferees specify the following major macroeconomic variables: nominal and real gross national product, the unemployment rate, consumer price inflation, the three-month Treasury bill rate, wages and salaries, and corporate profits. In six of the eight years considered here, the conferees used CBO or modified CBO economic assumptions; Administration assumptions were used for fiscal years 1982 and 1986. CBO then uses its statistical and other estimating techniques to project the levels of personal income taxes, corporate income taxes, interest payments on the debt, unemployment benefits, and all the other components of revenues and outlays consistent with the specified economic and policy assumptions. (In a few cases, the conferees have chosen to diverge from CBO technical estimating methods as well as from CBO economic assumptions.) Over the 1980-1987 period, inaccurate economic assumptions have caused the actual budget deficit to exceed the budget resolution estimates by an average of $23 billion, of which about $20 billion per year has resulted from a shortfall in revenues (see Table III-3). The effect of inaccurate economic assumptions on outlays has been small on average, although sizable in certain years.

Revenues. The $20 billion average economic error in revenue estimates can be viewed in three parts--$4 billion from windfall profit taxes on oil companies, $9 billion from corporate income taxes, and $7 billion from other taxes (primarily individual income taxes and social insurance contributions). Significant errors in windfall profit tax estimates, which previously arose from inaccurate forecasts of oil prices, should not recur, since corporations will incur only minor liabilities unless oil prices rise well above currently projected levels. The economic errors in the other revenue estimates can be explained largely by errors in the assumed level of nominal GNP. These errors were greatest in 1982 and 1983, as the budget resolutions first failed to foresee the recession and then missed the timing of its trough. But GNP was also overestimated in 1985, 1986, and 1987.

Table III-4 reports the results of regression equations relating the economic differences between actual revenues and those assumed in the budget resolutions to the differences between actual and assumed GNP. For revenues other than those from corporate profits and windfall profits, the two errors are almost strictly proportional. (The constant term in the regression is not statistically significant.) A $100 billion error in the GNP assumption for the fiscal year will cause the estimate for this category of revenues--dominated by individual income taxes and social insurance contributions--to err by $17 billion.

Economic errors in corporate profits taxes are also related to errors in GNP, although in a more complex fashion. According to the second equation

in Table III-4, an error of $100 billion in assumed GNP will cause an error of $6 billion in estimated corporate profits taxes. Even if the assumed level of GNP proved exact, however, corporate profits taxes would fall short of the estimate by $5.3 billion per year for other economic reasons. This constant term reflects a tendency toward optimism in economic assumptions other

TABLE III-3. ECONOMIC DIFFERENCES BETWEEN ACTUAL BUDGET TOTALS AND FIRST BUDGET RESOLUTION ESTIMATES FOR FISCAL YEARS 1980-1987
(In billions of dollars)

| | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987a/ | Average Difference | Average Absolute Difference |
|---|---|---|---|---|---|---|---|---|---|---|
| Revenues | | | | | | | | | | |
| Individual income | 4.4 | 10.8 | -13.1 | -18.5 | 5.3 | -7.2 | -11.6 | -4.4 | -4.3 | 9.4 |
| Corporate income | 2.8 | -4.4 | -13.8 | -16.4 | -4.7 | -7.0 | -6.6 | -20.0 | -8.8 | 9.5 |
| Social insurance | -0.8 | 0.6 | 10.8 | -12.4 | 0.1 | -3.9 | -2.3 | -1.8 | -3.9 | 4.1 |
| Windfall profits | -- | -5.4 | -14.2 | -8.4 | -1.1 | -0.7 | -2.8 | -2.1 | -4.3 | 4.3 |
| Other | 2.0 | 3.4 | -- | -2.3 | 4.8 | -1.2 | 0.3 | -1.0 | 0.8 | 1.9 |
| Total | 8.4 | 5.0 | -51.9 | -58.0 | 4.5 | -20.0 | -23.0 | -29.3 | -20.5 | 25.0 |
| Outlays | | | | | | | | | | |
| Entitlements | | | | | | | | | | |
| Medicare | 0.5 | 0.1 | -0.2 | -0.8 | -0.3 | -- | -- | -- | -0.1 | 0.2 |
| Guaranteed student loans | 0.4 | 0.8 | 0.2 | -0.5 | 0.8 | -0.5 | -0.5 | -0.4 | b/ | 0.5 |
| Indexed retirement and disability programs | 3.7 | 1.3 | -1.5 | -1.9 | -- | 0.5 | -1.9 | -1.4 | -0.1 | 1.5 |
| Unemployment compensation | 1.3 | -0.2 | 5.2 | 3.3 | -5.8 | 1.7 | b/ | -0.1 | 0.7 | 2.2 |
| Medicaid, Food Stamps, and public assistance | 0.8 | 0.6 | 1.1 | 0.4 | -0.3 | -0.2 | -0.5 | -0.3 | 0.2 | 0.5 |
| Other | -- | 0.4 | -- | 0.1 | -0.1 | -- | 0.1 | b/ | 0.1 | 0.1 |
| Subtotal | 6.7 | 3.0 | 4.9 | 0.6 | -5.6 | 1.4 | -2.8 | -2.2 | 0.7 | 3.4 |
| Nondefense discretionary | -- | 0.1 | 0.1 | 0.1 | 0.3 | b/ | b/ | -0.1 | b/ | 0.1 |
| Net interest | | | | | | | | | | |
| Interest rates | 5.5 | 2.8 | 12.4 | -4.2 | 12.3 | -7.9 | -10.3 | -11.3 | -0.1 | 8.3 |
| Debt service | 0.2 | 0.6 | 6.7 | 4.0 | 0.2 | 1.3 | 0.8 | 1.1 | 1.9 | 1.9 |
| Subtotal | 5.8 | 3.4 | 19.1 | -0.2 | 12.5 | -6.6 | -9.5 | -10.2 | 1.8 | 8.4 |
| Offsetting receipts | -- | -- | -- | -- | -- | -- | 0.3 | 0.3 | 0.1 | 0.1 |
| Total | 12.4 | 6.4 | 24.1 | 0.5 | 7.1 | -5.2 | -12.1 | -12.2 | 2.6 | 10.0 |
| Deficit | 4.0 | 1.4 | 76.0 | 58.5 | 2.7 | 14.8 | 10.9 | 17.1 | 23.2 | 23.2 |

SOURCE: Congressional Budget Office

a. The figures for 1987 are preliminary.
b. Less than $50 million.

than GNP that affect corporate profits tax estimates. A major explanation for this result is that the budget resolutions have systematically overestimated the share of corporate profits in national income. Also, the budget resolution forecasts have misestimated the amount and composition of new business investment and consequent depreciation allowances.

In total, an error of $100 billion in the estimate of nominal GNP (or about 2 percent of current levels) will lead to an error of $23 billion in estimated revenues. Not by coincidence, the ratio of the two numbers is close to the ratio of total taxes to GNP.

Outlays. Inaccurate economic assumptions have caused outlay underestimates averaging $3 billion; the average absolute error is $10 billion per year. Net interest has been the category of spending most affected by inaccurate economic assumptions, with an average absolute difference of

TABLE III-4. EQUATIONS RELATING ECONOMIC DIFFERENCES BETWEEN ACTUAL AND ESTIMATED REVENUES TO DIFFERENCES BETWEEN ACTUAL AND ASSUMED GROSS NATIONAL PRODUCT

| Economic Difference in | Coefficient on Constant | Coefficient on GNP Difference | $\bar{R}^2$ |
|---|---|---|---|
| Revenues, Excluding Corporate Profits and Windfall Profits Taxes | 2.5 | 0.17 | 0.86 |
| | (0.9) | (6.6) | |
| Corporate Profits Taxes | -5.3 | 0.06 | 0.47 |
| | (-2.3) | (2.7) | |

SOURCE: Congressional Budget Office.

NOTE: The equations are estimated using budget resolution assumptions for fiscal years 1980 through 1987. T-statistics (shown in parentheses) measure whether a coefficient is statistically different from zero. $R^2$ is a measure of the regressions ability to explain the variation in the dependent variable.

$8.3 billion resulting from erroneous interest rate forecasts. As the federal debt has grown rapidly during the 1980s, outlays have become increasingly sensitive to interest rates. At the start of 1980, federal debt held by the public amounted to $645 billion; by 1987 it had almost tripled to $1.9 billion. At mid-decade the federal government was borrowing about $200 billion a year in new money and was refinancing about $600 billion a year of its existing marketable debt. Interest rates during the 1980s have also been more volatile than in the preceding decades. In 1980, 1981, and 1982 interest rates sometimes changed by more than one percentage point from one week to the next. In more recent years, week-to-week changes of one- or two-tenths of a percentage point are common.

Because debt financing locks the Treasury into current interest rates for some time, errors in assumed interest rates in both the budget year and the prior year affect the accuracy of the interest outlay estimates. As noted in Chapter II, erring by one percentage point on interest rates for the budget year affects outlays by about $5 billion. Erring by one percentage point for the prior year would affect outlays by another $5 billion.

Errors in the budget resolutions' net interest projections as a result of inaccurate interest rate assumptions ranged from underestimates of $12 billion in 1982 and 1984 to overestimates of more than $10 billion in 1986 and 1987. While in this case the uncertainty is large, the bias, as reflected in the average difference, was negligible. Errors in other economic assumptions, by causing the deficit to exceed the estimates, have added $1.9 billion per year to debt service costs, as shown in Table III-3.

After net interest, unemployment compensation is the spending program whose estimates have been most affected by inaccurate economic assumptions, with an average absolute difference of $2.2 billion. Failure to anticipate the 1981-1982 recession resulted in a $5 billion underestimate of unemployment insurance outlays in fiscal year 1982, while unexpectedly strong growth led to a $6 billion overestimate in 1984. As with interest, the uncertainty exceeds the bias, since the average difference shows an understatement of only $0.7 billion per year.

## CBO Economic Assumptions

The Congress may choose to base the budget resolution either on the CBO economic forecast or on some alternative. In 1982 and 1986, Administration forecasts were used. Had CBO estimates been used in those two years, the average error in the deficit estimates resulting from economic assumptions would have been about $2.5 billion less, but still over $20 billion.

While CBO's recent forecasts have proved optimistic in retrospect, so did most other contemporary forecasts. Forecasts generated by mechanical time-series models would also have erred in the same direction, and by larger amounts. This tendency toward optimism results largely from the decline in the growth of productivity described in earlier CBO reports. This section compares the CBO forecasting record with that of other forecasters and with mechanical methods

Comparisons of economic forecasts with each other and with actual data are difficult to make because each forecast contains several variables. The accuracy of the forecast will differ for different variables, and all variables are not equally important with respect to their effects on the budget projections. As discussed above, however, the assumed level of the gross national product (in current dollars) has far more effect on revenues and the deficit than any other single economic variable.

In Table III-5, therefore, a comparison is made between the GNP forecasts of the Congressional Budget Office, the Office of Management and Budget (OMB), and several private forecasters--Chase Econometrics, Data Resources, Inc. (DRI), and Wharton Econometric Forecasting Associates (WEFA). The table shows the level of the GNP forecast in January for the upcoming fiscal year and also the percentage error of the forecast. It also shows the percentage error of a forecast produced by a mechanical time-series procedure, in which GNP is predicted solely on the basis of its own history. The use of time-series predictions for evaluating forecasts is common, because a forecast that is defensible statistically and at the same time detached from the subjectivities of human forecasters is felt to provide a good benchmark for evaluating other forecasts. (The data sources, the time-series models, and the procedures used here are summarized in Appendix A.)

For each of the forecasts, Table III-5 shows the mean percentage error (the average of the percentage errors for the individual years) and the mean absolute percentage error (the average of the percentage errors ignoring whether the errors were positive or negative). These figures may be taken as measures of bias and uncertainty, respectively, like the summary measures shown on the earlier tables of budget estimates. If CBO has been unduly optimistic, for example, one would expect to find its mean percentage error to be higher than the mean error of the other forecasts and the time-series model.

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No firm conclusions can be drawn on the basis of only 10 observations (the number of years for which there are data on CBO errors). The sample is just not large enough to distinguish systematic errors from random ones. Nevertheless, the table suggests the following:

TABLE III-5. BUDGET YEAR GNP FORECASTS AND ERRORS (By fiscal year)

| Fiscal Year | Actual a/ | CBO | OMB | CHASE | DRI | WEFA | Mechanical b/ |
|---|---|---|---|---|---|---|---|
| | | | | Forecasts in Billions of Current Dollars | | | |
| 1978 | 2,044.8 | 1,987.0 | 2,038.4 | 1,953.2 | 2,011.1 | 2,030.2 | 1,956.1 |
| 1979 | 2,313.1 | 2,247.9 | 2,274.6 | 2,222.7 | 2,245.8 | 2,270.4 | 2,238.4 |
| 1980 | 2,521.4 | 2,515.1 | 2,505.7 | 2,436.6 | 2,475.7 | 2,460.6 | 2,538.6 |
| 1981 | 2,856.5 | 2,767.3 | 2,764.4 | 2,738.1 | 2,785.7 | 2,760.5 | 2,853.3 |
| 1982 | 3,031.2 | 3,211.1 | 3,191.8 | 3,220.0 | 3,204.9 | 3,232.4 | 3,167.4 |
| 1983 | 3,228.4 | 3,424.1 | 3,433.6 | 3,462.5 | 3,428.8 | 3,448.4 | 3,515.5 |
| 1984 | 3,581.2 | 3,498.8 | 3,488.7 | 3,532.7 | 3,509.3 | 3,530.5 | 3,501.9 |
| 1985 | 3,834.6 | 3,910.0 | 3,890.1 | 3,883.0 | 3,849.8 | 3,901.5 | 3,761.8 |
| 1986 | 4,163.4 | 4,158.2 | 4,198.5 | 4,139.7 | 4,086.1 | 4,150.4 | 4,212.3 |
| 1987 | 4,406.8 | 4,503.7 | 4,538.1 | 4,432.6 | 4,401.8 | 4,467.1 | 4,605.6 |
| | | | | Percentage Errors (Forecast Minus Actual as a Percent of Actual) | | | |
| 1978 | | -2.8 | -0.3 | -4.5 | -1.6 | -0.7 | -4.3 |
| 1979 | | -2.8 | -1.7 | -3.7 | -2.9 | -1.8 | -3.2 |
| 1980 | | -0.2 | -0.6 | -3.4 | -1.8 | -2.4 | 0.7 |
| 1981 | | -3.1 | -3.2 | -4.1 | -2.5 | -3.4 | -0.1 |
| 1982 | | 5.9 | 5.3 | 6.2 | 5.7 | 6.6 | 4.5 |
| 1983 | | 6.1 | 6.4 | 7.3 | 6.2 | 6.8 | 8.9 |
| 1984 | | -2.3 | -2.6 | -1.4 | -2.0 | -1.4 | -2.2 |
| 1985 | | 2.0 | 1.4 | 1.3 | 0.4 | 1.7 | -1.9 |
| 1986 | | -0.1 | 0.8 | -0.6 | -1.9 | -0.3 | 1.2 |
| 1987 | | 2.2 | 3.0 | 0.6 | -0.1 | 1.4 | 4.5 |
| | | | | Summary Statistics | | | |
| Mean Percentage Error | | | | | | | |
| 1978-87 | | 0.5 | 0.9 | -0.2 | c/ | 0.7 | 0.8 |
| 1980-87 | | 1.3 | 1.3 | 0.7 | 0.5 | 1.1 | 1.9 |
| Mean Absolute Percentage Error | | | | | | | |
| 1978-87 | | 2.8 | 2.5 | 3.3 | 2.5 | 2.7 | 3.2 |
| 1980-87 | | 2.7 | 2.9 | 3.1 | 2.6 | 3.0 | 3.0 |

SOURCES: Forecasts are those for the budget year as constructed in late January of the previous calendar year. Forecast series for CBO and OMB were obtained from unpublished quarterly forecast tables. Other institutional forecasts were obtained from published reports. See Appendix A.

a. The actual series consists of the estimate published by the Commerce Department in the first November following the close of the respective fiscal year. For 1987, the latest available forecasts of CBO, OMB DRI, and WEFA were averaged.

b. This is the average of 42 univariate autoregressive forecasts. See Appendix A.

c. Less than 0.5 in absolute value.

- The patterns of errors are similar for CBO and the other forecasts. During the 1980s, all of the forecasts overestimated GNP on average. Moreover, all of the forecasts tended to err in the same direction each year. The errors were especially large in 1982 and 1983, around the trough of the recession.

- No single forecaster has consistently proved best. The forecaster having the smallest error in one year sometimes has the largest error the next.

- The size of the mean percentage error depends critically on the years being examined. For example, CBO's mean percentage error is 1.3 percent for 1980-1987 but only 0.5 percent if 1978 and 1979 are added to the calculation.

- The uncertainty of the estimates, as estimated by the mean absolute percentage error, is much more stable across forecasters and across years than is the mean percentage error.

- Compared with the private forecasts, the accuracy of CBO's forecasts is mixed. CBO's mean percentage error during the 1980s is higher than that of the three private forecasts, although probably not by a statistically significant amount. Its mean absolute percentage error, however, is less than two out of three.

- Compared with the unbiased mechanical forecasts, the CBO forecasts were not optimistic at the time they were made. In retrospect, they did prove too optimistic, because the economy grew at a rate below the historical trend.

As discussed in Appendix B and in previous CBO reports, the trend growth in productivity and GNP has slowed during the 1980s. Since all recent forecasts have tended to overestimate GNP, it seems reasonable to attribute the forecast errors to a general failure to anticipate the change in the underlying trend and not to any bias on the part of the forecasters. In fact, CBO, OMB, and the private-sector forecasters have performed slightly better than the mechanical forecasts, which merely extrapolated recent history.

## ERRORS IN TECHNICAL ASSUMPTIONS

All errors in budget projections that do not fit one of the previous categories are classified as technical. Budget estimates would be imprecise

even if their policy and economic assumptions were completely borne out. On the revenue side of the budget, technical errors can result, for example, from erroneous assumptions about the timing of realizations of capital gains or the amount of contributions to tax-deferred retirement arrangements. Similiarly, in making spending projections, no one can predict exactly how many eligible people will apply for Social Security benefits next year or how fast the Department of Defense will spend its appropriations. Some of the technical assumptions are really subsidiary assumptions about the economy--for example, assumptions about agricultural exports and commodity prices, which affect spending for farm price supports.

Technical errors caused the first budget resolution to underestimate the actual deficits by an average of $8.7 billion per year--$1.5 billion from lower revenues and $7.2 billion from higher outlays (see Table III-6). The average absolute errors are $5.0 billion for revenues (less than 1 percent) and $14.9 billion for outlays (less than 2 percent).

Of the $8.7 billion average technical error, about one-half ($4.4 billion) results from underestimating outlays for farm price supports, while about one-quarter ($2.0 billion) comes from overestimating corporate income tax receipts. There have also been relatively large errors in estimating national defense outlays and individual income tax revenues in several years, but over time these errors have canceled out. They have not contributed significantly to the average underestimate of the deficit. Apart from these areas, technical estimating errors have generally been small and random.

## Revenues

Corporate income taxes are the only revenue source that has been regularly overestimated for technical reasons--by an average of $2.0 billion per year. Not surprisingly, they also show a large average absolute technical estimating error--$3.2 billion, or about 5 percent of collections. Of the major categories of revenues, corporate taxes are by far the most erratic--both in dollar terms and as a percent of GNP. Corporate profits taxes even vary substantially as a fraction of economic profits--for example, falling from 31 percent of profits in fiscal year 1982 to 20 percent in 1983.

Individual income tax estimates have about the same average absolute technical difference as corporate income taxes. In relation to collections, however, the average absolute difference is much smaller--less than 1 percent. Over the 1980-1987 period, individual income taxes have been underestimated by an average of $1.4 billion for technical reasons, although the average error would be negligible if the 1987 experience were excluded

TABLE III-6. TECHNICAL DIFFERENCES BETWEEN ACTUAL BUDGET TOTALS AND FIRST BUDGET RESOLUTION ESTIMATES FOR FISCAL YEARS 1980-1987
(In billions of dollars)

| | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 a/ | Average Difference | Average Absolute Difference |
|---|---|---|---|---|---|---|---|---|---|---|
| Revenues | | | | | | | | | | |
| Individual income | 5.7 | -3.1 | 0.1 | 3.0 | -0.5 | b/ | -3.7 | 10.0 | 1.4 | 3.3 |
| Corporate income | -8.5 | -1.8 | 2.2 | -1.1 | -2.5 | 2.4 | -2.3 | -4.7 | -2.0 | 3.2 |
| Social insurance | 0.2 | -2.4 | -0.5 | -1.0 | -0.1 | 1.5 | 1.7 | 1.6 | 0.1 | 1.1 |
| Other revenue sources | -0.9 | -2.3 | 1.0 | 0.3 | -0.8 | -0.6 | 2.1 | 3.8 | 0.3 | 1.5 |
| Unallocated by source | -- | -3.0 | -- | -3.9 | -- | -- | -- | -- | -0.9 | 0.9 |
| Accounting change | -- | -- | -3.9 | -- | -- | -- | -- | -- | -0.5 | 0.5 |
| Total | -3.5 | -12.6 | -1.1 | -2.7 | -3.9 | 3.3 | -2.1 | 10.7 | -1.5 | 5.0 |
| Outlays | | | | | | | | | | |
| National defense | 5.2 | 1.4 | 2.7 | -4.6 | -11.9 | -12.4 | 7.0 | 0.6 | -1.5 | 5.7 |
| Entitlements | | | | | | | | | | |
| IMF, exchange stabilization fund and FMS trust fund | -0.3 | 0.7 | 0.4 | -1.3 | 0.1 | -0.8 | -3.0 | -0.3 | -0.6 | 0.9 |
| Farm price supports | -1.7 | 2.3 | 11.0 | 10.6 | -1.2 | 2.4 | 10.3 | 1.2 | 4.4 | 5.1 |
| FDIC and FSLIC | 1.3 | 0.7 | -0.8 | 1.0 | 1.4 | 0.2 | 2.7 | 6.0 | 1.6 | 1.8 |
| Medicare and Medicaid | 0.9 | 4.0 | 3.8 | 0.9 | -4.0 | 0.3 | 1.8 | 2.9 | 1.3 | 2.3 |
| Social Security | -0.9 | -1.1 | -1.7 | 2.0 | 1.1 | -0.5 | -0.2 | -0.7 | -0.3 | 1.0 |
| Unemployment compensation | 1.0 | -0.3 | -0.1 | -2.6 | -3.0 | -0.4 | 0.3 | 0.8 | -0.5 | 1.1 |
| AFDC, SSI, and EITC | 0.7 | 1.0 | b/ | -0.2 | 1.1 | 1.1 | 0.8 | 1.1 | 0.7 | 0.8 |
| Other | 0.7 | 3.1 | -0.1 | 2.3 | -0.2 | -0.1 | 0.1 | 2.4 | 1.0 | 1.1 |
| Subtotal | 1.7 | 10.3 | 12.5 | 12.6 | -4.6 | 2.1 | 12.7 | 13.5 | 7.6 | 8.8 |

(Continued)

SOURCE: Congressional Budget Office.

a. The figures for 1987 are preliminary.
b. Less than $50 million.

from the calculation. Technical errors in estimates of social insurance contributions have been extremely small. The average difference between the estimates and the results is only $0.1 billion. The average absolute difference is $1.1 billion, or about 0.4 percent of collections.

TABLE III-6. (Continued)

| | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | Average Difference | Average Absolute Difference |
|---|---|---|---|---|---|---|---|---|---|---|
| Nondefense discretionary | 9.2 | 5.2 | -4.8 | -2.5 | -2.9 | -2.0 | -6.0 | -2.2 | -0.7 | 4.4 |
| Net interest | | | | | | | | | | |
| Debt service | 1.2 | 3.1 | b/ | -0.1 | -2.5 | -1.4 | 0.6 | 1.0 | 0.2 | 1.2 |
| Other | -0.1 | 0.6 | -3.7 | -3.5 | 1.1 | 2.2 | 3.5 | 2.8 | 0.4 | 2.2 |
| Subtotal | 1.1 | 3.7 | -3.6 | -3.6 | -1.4 | 0.9 | 4.0 | 3.8 | 0.6 | 2.8 |
| Offsetting receipts | | | | | | | | | | |
| Timber and mineral receipts | -0.2 | 0.2 | 1.3 | 1.6 | 0.7 | 0.2 | 0.2 | 0.5 | 0.6 | 0.6 |
| OCS receipts | -1.2 | -5.1 | 3.5 | 3.9 | 1.7 | -0.8 | 3.2 | 2.6 | 1.0 | 2.8 |
| Other | -0.2 | 0.3 | b/ | 0.6 | 0.4 | -0.8 | -1.1 | 0.9 | b/ | 0.6 |
| Subtotal | -1.6 | -4.6 | 4.8 | 6.1 | 2.7 | -1.5 | 2.2 | 4.0 | 1.5 | 3.4 |
| Accounting change | -- | -- | -3.9 | -- | -- | -- | -- | 1.0 | -0.4 | 0.6 |
| Total | 15.6 | 16.0 | 7.7 | 8.1 | -18.0 | -12.9 | 20.1 | 20.8 | 7.2 | 14.9 |
| Deficit | 19.1 | 28.6 | 8.8 | 10.8 | -14.1 | -16.2 | 22.2 | 10.2 | 8.7 | 16.2 |

Of the $1.5 billion average overestimate of total revenues, $0.9 billion results from ad hoc adjustments to the revenue targets made by the budget resolution conferees in 1981 and 1983. Another $0.5 billion is attributable to a 1982 accounting change, which affected revenues and outlays by equal amounts and had no effect on the deficit. Neither of these errors represents a deficiency in estimating procedures.

## Outlays

The largest technical errors in spending estimates have arisen in national defense and in farm price supports. Both programs have experienced average absolute differences in excess of $5 billion. Defense spending estimates have erred in both directions, and the measure of bias, the average error, has been only $1.5 billion, less than 1 percent of defense outlays. Farm price support estimates, on the other hand, have understated actual spending

by an average of $4.4 billion, or about one-third of program costs. This difference in the relative accuracy of the estimates derives in large part from differences in the ways the two programs operate.

National defense spending is controlled by annual appropriations, which give the Defense Department authority to contract for goods and services. Cash outlays arise, however, only when the goods and services are actually produced or delivered. Outlay differences that result from differences between the actual appropriation and that assumed in the budget resolution are classified as policy differences. Differences that result from misestimating the rate at which the appropriations result in outlays are labeled technical.

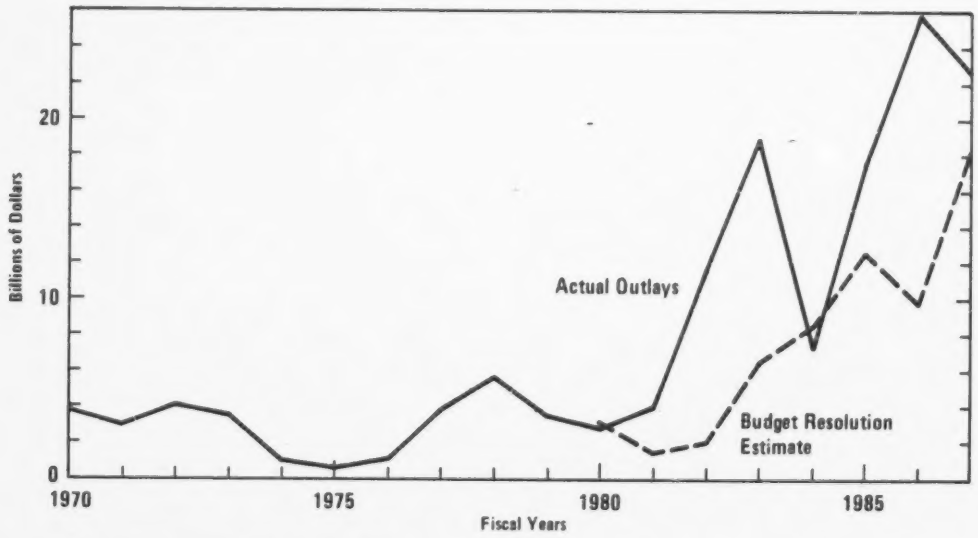
In some cases, notably in the budget accounts for the services of the military and civilian personnel of the government, the outlays occur almost entirely in the year for which the budget authority is appropriated. In other instances--for example, procurement of major weapons systems, such as ships, tanks, or aircraft--the outlays are spread over several years. CBO estimates outlays for each national defense budget account by applying spendout rates that reflect the historical rates at which appropriations have resulted in outlays. Since most appropriations eventually result in outlays (although a small amount lapses and is never spent), errors in assumed spendout rates are unlikely to cause persistent errors in outlay estimates. If spending is misestimated in one year as a result of an incorrect spendout rate, there is likely to be an offsetting error in a later year. In the eight years for which data are available, defense outlays have been overestimated in three years and underestimated in five. The overestimates in 1984 and 1985 were particularly large, however, so that the average technical error in defense is an overestimate of $1.5 billion, or about one-half of 1 percent of current defense outlays.

The farm price support program is an entitlement program and is not controlled by the appropriation process. This means that all those who meet the eligibility criteria established by law and regulation are entitled to support, which is given through loans, commodity purchases, cash payments, and other means. Program outlays are therefore dependent on developments in the agricultural sector, such as domestic weather conditions, crop yields, foreign demand, and commodity prices. Not only are these factors difficult to predict, but the program has been significantly affected by changes in law or regulations almost every year. As a result, farm price support outlays have been extremely erratic, as pictured in Figure III-3. In forecasting any such series based on historical experience, there is a

tendency to underpredict changes, whether increases or decreases. Such has been the case with farm price supports. The average underestimate of $4.4 billion results primarily from missing the very large increases in 1982, 1983, and 1986.

Outlays for deposit insurance and the major health care entitlements have also tended to be underestimated for technical reasons, but by lesser amounts. The outlays of the two major deposit insurance funds (the Federal Deposit and the Federal Savings and Loan Insurance Corporations) have been understated by an average of $1.6 billion per year. The spending of these two agencies may rise by billions of dollars because of the failure of just one or two banks; moreover, the agencies have considerable discretion regarding the timing and form of assistance provided to troubled financial institutions. Medicare and Medicaid have had technical estimating errors averaging $1.3 billion per year, or a little over 1 percent of program outlays. Estimating outlays for these programs, as for farm price supports, has been complicated by frequent legislative and administrative changes designed to control the cost of the programs. In addition to the usual uncertainties about the rate of increase in medical care costs, caseloads, and utilization, it has been necessary to predict the response of health care providers to the new laws.

Figure III-3.
## Farm Price Support Outlays




SOURCE: Congressional Budget Office.

## UNCERTAINTY IN BUDGET ESTIMATES

The foregoing analysis has demonstrated that policy differences, inaccurate technical estimating methods, and inaccurate economic assumptions have all been a factor in underestimating the deficits during the 1980s. Policy differences may be reduced to the extent that the policies of the budget resolution are more fully implemented. Some reduction in the size of the technical differences may be possible, although this is already the smallest of the three sources of error But the inherent unpredictability of the economy will remain the greatest source of uncertainty in the budget estimates. There are at least two ways of quantifying this uncertainty. One is forward looking; the other backward looking.

The prospective approach uses a time-series model to estimate the uncertainty of GNP forecasts for fiscal year 1988. The model (described in Appendix A) recognizes random elements that will cause any one particular forecast to be somewhat too high or too low. The larger are these random shocks, the greater will be the average difference (whether positive or negative) between any single forecast of the model and the actual outcome.

Figure III-4 shows an estimate of the range of uncertainty surrounding CBO's January 1987 forecast of nominal GNP for fiscal year 1988. The distribution shown is the result of simulating the time-series model 5,000 times, but with different random shocks applied. The standard deviation of the forecasts--a statistical measure of the dispersion of the individual forecasts around the average--is $190 billion. Under assumptions detailed in the appendix, one can expect that about 68 percent of the time forecasts of GNP will differ from the actual GNP by less than $190 billion (one standard deviation). About 95 percent of the time, the forecasts will differ by less than $380 billion (two standard deviations).

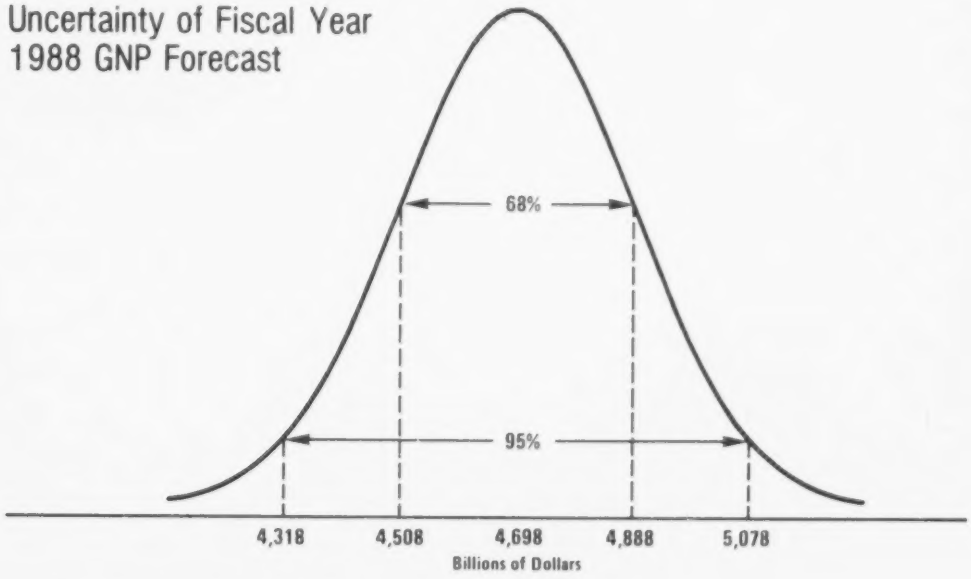
This uncertainty range for GNP forecasts may be translated into an uncertainty range for revenue and deficit estimates. As discussed above, a $100 billion error in estimating the gross national product will tend to result in a $23 billion error in revenues. Thus, a $190 billion error (one standard deviation) in GNP corresponds to a $44 billion error in revenues. A range of plus or minus $88 billion would be required to encompass 95 percent of the revenue outcomes.

The retrospective approach employs the 1980-1987 data for economic errors displayed previously in Table III-3. Excluding windfall profits taxes, the root mean square error in revenue estimates resulting from economic

assumptions over these years was $26 billion. (The root mean-square-error is similar to the standard deviation but reflects the fact that the average economic error during the 1980s was not zero.) While this estimate suggests a smaller range of uncertainty than the model-based approach, it must be remembered that the economy was smaller in the 1980-1987 period than it will be in 1988. If the estimate is adjusted to reflect the intervening growth in GNP, the resulting root mean-square-error in revenues due to inaccurate economic assumptions would be about $36 billion.

Uncertainty in budget projections can arise, of course, from uncertainty in forecasting other economic variables, notably interest rates. But errors in GNP forecasts and interest-rate forecasts are not likely to be independent. For example, underestimating inflation may lead to underestimates both of nominal GNP and of nominal interest rates. CBO is currently developing estimates of uncertainty that will take interest-rate uncertainties into account. In the meantime, the estimates involving GNP alone provide a good indication of the size of errors in budget projections that are likely to result from inaccurate economic forecasts.

Figure III-4.
Uncertainty of Fiscal Year 1988 GNP Forecast




SOURCE: Congressional Budget Office.

# APPENDIXES

APPENDIX A

# SOURCES FOR ANALYZING ECONOMIC AND BUDGET ERRORS

Chapter III compared the budget estimates contained in the Congressional budget resolutions with the actual outcomes, reviewed the forecasting records of CBO and several other forecasters, and also presented some mechanical forecasts. This appendix provides the data sources for these analyses.

## BUDGET RESOLUTION ESTIMATES

The actual budget totals for fiscal years 1976 through 1985 shown in the Administration's 1988 budget are not comparable to the first budget resolutions for those years as a result of changes in the budgetary treatment of various items. Table A-1 shows actual totals that have been adjusted to agree with the accounting treatment used in the budget resolution.

Data for fiscal year 1985 and earlier years must be adjusted to exclude outlays (primarily the Federal Financing Bank, Strategic Petroleum Reserve, and Postal Service) that were considered off-budget before enactment of the Balanced Budget and Emergency Deficit Control Act of 1985. In addition, since fiscal year 1976, the budgetary treatment of seven items has changed: the Export-Import Bank, the Housing for the Elderly or Handicapped Fund, the earned income tax credit, the Exchange Stabilization Fund, gold sales, the Pension Benefit Guaranty Corporation, and Medicare premiums. 1/

## SOURCES OF INSTITUTIONAL FORECASTS

In undertaking any comparison of published economic forecasts, analysts must recognize fundamental distinctions between forecasts based on the availability of information, differing assumptions, and subjective judgments.

1. See Congressional Budget Office, *An Analysis of Congressional Budget Estimates for Fiscal Years 1980-1982* (June 1984), pp. 59-62.

TABLE A-1. CONGRESSIONAL BUDGET RESOLUTIONS AND ACTUAL BUDGET TOTALS (In billions of dollars)

| Fiscal Year | Revenues | Outlays | Surplus or Deficit (-) |
|---|---|---|---|
| Fiscal Year 1976 | | | |
| First resolution | 298.2 | 367.0 | -68.8 |
| Second resolution | 300.8 | 374.9 | -74.1 |
| Actual | 299.2 | 364.8 | -65.6 |
| Fiscal Year 1977 | | | |
| First resolution | 362.5 | 413.3 | -50.8 |
| Second resolution | 362.5 | 413.1 | -50.6 |
| Third resolution | 347.7 | 417.5 | -69.8 |
| Third resolution amended | 356.6 | 409.2 | -52.6 |
| Actual | 356.9 | 401.9 | -45.0 |
| Fiscal Year 1978 | | | |
| First resolution | 396.3 | 461.0 | -64.6 |
| Second resolution | 397.0 | 458.3 | -61.3 |
| Actual | 401.1 | 449.9 | -48.8 |
| Fiscal Year 1979 | | | |
| First resolution | 447.9 | 498.8 | -50.9 |
| Second resolution | 448.7 | 487.5 | -38.8 |
| Revised second resolution | 461.0 | 494.5 | -33.4 |
| Actual | 465.9 | 493.7 | -27.7 |
| Fiscal Year 1980 | | | |
| First resolution | 509.0 | 532.0 | -23.0 |
| Second resolution | 517.8 | 547.6 | -29.8 |
| Revised second resolution | 525.7 | 572.7 | -47.0 |
| Actual | 520.1 | 579.6 | -59.6 |
| Fiscal Year 1981 | | | |
| First resolution | 613.8 | 613.6 | 0.2 |
| Second resolution | 605.0 | 632.4 | -27.4 |
| Revised second resolution | 603.3 | 661.4 | -58.0 |
| Actual | 602.6 | 660.5 | -57.9 |
| Fiscal Year 1982 | | | |
| First resolution | 657.8 | 695.4 | -37.6 |
| Revised second resolution | 628.4 | 734.1 | -105.7 |
| Actual | 617.8 | 728.4 | -110.7 |

(Continued)

TABLE A-1. (Continued)

| Fiscal Year | Revenues | Outlays | Surplus or Deficit (-) |
|---|---|---|---|
| Fiscal Year 1983 | | | |
| First resolution | 665.9 | 769.8 | -103.9 |
| Revised second resolution a/ | 604.3 | 807.4 | -203.1 |
| Actual | 600.6 | 796.0 | -195.4 |
| Fiscal Year 1984 | | | |
| First resolution b/ | 679.6 | 851.2 | -171.6 |
| Revised second resolution | 672.9 | 845.6 | -172.7 |
| Actual | 666.5 | 841.8 | -175.3 |
| Fiscal Year 1985 | | | |
| First resolution c/ | 750.9 | 932.0 | -181.2 |
| Revised second resolution c/ | 736.5 | 935.9 | -199.4 |
| Revised second resolution d/ | 736.5 | 946.3 | -209.8 |
| Actual c/ | 734.1 | 936.8 | -202.8 |
| Actual d/ | 734.1 | 946.3 | -212.3 |
| Fiscal Year 1986 | | | |
| First resolution | 795.7 | 967.6 | -171.9 |
| Actual | 769.1 | 989.8 | -220.7 |
| Fiscal Year 1987 | | | |
| First resolution | 852.4 | 995.0 | -142.6 |
| Current estimate | 852.9 | 1,010.4 | -157.4 |

SOURCE: Congressional Budget Office.

NOTE: Actual totals have been adjusted where necessary to agree with the budgetary treatment of various items for the budget resolutions and may, therefore, differ from the totals shown elsewhere in this report. Data for fiscal year 1984 and earlier years exclude outlays (primarily Federal Financing Bank, Strategic Petroleum Reserve, and Postal Service) that were considered off-budget before enactment of the Balanced Budget and Emergency Deficit Control Act of 1985.

a. Outlays exclude amounts reserved pursuant to Section 2 of the budget resolution.
b. Adjusted for enactment of reserve fund programs.
c. On-budget only; see note.
d. On- and off-budget combined; see note.

Determining which of these factors contributed to forecast errors, and to what extent, is often difficult, if not impossible. In the comparisions of forecasts in Chapter III, CBO attempted to make the alter-native forecasts comparable by identifying the economic data used at the time the forecasts were made and, wherever possible, ensuring that these data were the same in each case. What remains are disparities resulting from differences in models, assumptions, and judgments.

Because published GNP forecasts are typically reported only on a calendar year basis, the fiscal year forecasts for CBO and OMB were calculated from unpublished quarterly data. The OMB fiscal year forecasts of GNP are consistent with the calendar year aggregates reported in the Administration's budget documents published in the winter of each year. Although CBO's forecasts of fiscal year GNP used in Chapter III are consistent with its published winter economic forecast, in several years the published forecasts were not used in budget resolutions or in subsequent CBO publications.

The first two columns of Table A-2 show the release dates for the National Income and Product Accounts (NIPA) data underlying the CBO and OMB forecasts in each year. In two of the ten years reported, CBO had an

TABLE A-2. DATA SOURCES FOR THE INSTITUTIONAL FORECAST COMPARISON

| Fiscal Year | NIPA Release Date | | Publication Date | | |
|---|---|---|---|---|---|
| | CBO | OMB | Chase | DRI | WEFA |
| 1978 | Nov. 1976 | Dec. 1976 | Nov. 1976 | Dec. 1976 | Dec. 1976 |
| 1979 | Jan. 1978 | Dec. 1977 | Jan. 1978 | Feb. 1978 | Feb. 1978 |
| 1980 | Dec. 1978 | Dec. 1978 | Dec. 1978 | Jan. 1979 | Dec. 1978 |
| 1981 | Jan. 1980 | Dec. 1979 | Jan. 1980 | Feb. 1980 | Jan. 1980 |
| 1982 | Jan. 1981 | Jan. 1981 | Jan. 1981 | Feb. 1981 | Jan. 1981 |
| 1983 | Dec. 1981 | Jan. 1982 | Dec. 1981 | Jan. 1982 | Jan. 1982 |
| 1984 | Jan. 1983 | Jan. 1983 | Jan. 1983 | Feb. 1983 | Feb. 1983 |
| 1985 | Jan. 1984 | Jan. 1984 | Jan. 1984 | Feb. 1984 | Feb. 1984 |
| 1986 | Jan. 1985 | Jan. 1985 | Jan. 1985 | Feb. 1985 | Feb. 1985 |
| 1987 | Jan. 1986 | Jan. 1986 | Jan. 1986 | Feb. 1986 | Feb. 1986 |

SOURCE: Congressional Budget Office.

additional quarter of data (1979 and 1981), while in one year (1983) OMB had an additional quarter of data on which to base a forecast. The potential distortions stemming from these discrepancies in information could not be avoided since the two winter forecast series are available only once a year. The statistics on percentage errors tabulated in Chapter III (Table III-5), however, suggest that these distortions might not have been significant.

Because they are published monthly, the Chase Econometrics (Chase), Data Resources, Inc. (DRI), and Wharton Econometric Forecasting Associates (WEFA) forecasts could be chosen to avoid such discrepancies in information. They were selected to coincide with the NIPA data underlying the CBO forecasts. The publication dates for these forecasts are shown in the last three columns of Table A-2.

For the purpose of determining forecast accuracy, the series on actual budget year GNP was defined as the NIPA estimate of GNP released by the Commerce Department in the first November after the end of the fiscal year. For example, the actual GNP for budget year 1983 was taken to be the estimate of GNP in fiscal year 1983 as published in the *Survey of Current Business* in November 1983. The November estimates incorporate more complete underlying data than do the October estimates (the first published for each fiscal year). Later estimates were not used because, for fiscal year 1985, they would have involved conceptual revision in GNP. The actual GNP for fiscal year 1987 was estimated by averaging the latest available CBO, OMB, DRI, and WEFA forecasts.

Because the series on actual GNP have, in most cases, been revised many times since their original publication, this procedure for selecting them does not provide the best currently available estimate of historical GNP. The procedure does, however, have the virtue of providing an estimate of GNP that is close, in a conceptual sense at least, to the magnitude being forecast.

## MECHANICAL FORECASTS

The mechanical forecasts discussed in Chapter III were the result of an automated forecasting procedure. Forty-two alternative procedures for specifying autoregressive equations for GNP were carried out. 2/ Once

2. An autoregression of a time series is a regression of the current values of the series against its lagged values.

they were specified, the equations were then estimated for the data underlying the CBO forecast. Finally, a forecast for budget year GNP was made using each equation. The average of the 42 forecasts for each year is reported in Table III-5.

The equation specifications differed in the assumed data transformations (that is, levels and natural logarithms, no differencing, first differencing, second differencing, polynomial trend terms, and estimated pre-filters), and in the procedures for calculating the autoregressive lag lengths. For each of the NIPA data sets used by CBO (Table A-2), the alternative specifications for GNP were estimated over an historical period ending ten years prior to the release of the data and then forecast eight quarters ahead. Next, another quarter of data was added, the equations reestimated, and another two-year forecast generated. This process was repeated until the last available data point (that is, the dates in the CBO column of Table A-2) was reached. Statistics on out-of-sample forecast errors were collected on each round.

In each estimation period, the single most accurate (out-of-sample) specification over the previous decade was compared with the mean of all the alternative specifications. The mean forecast had a superior out-of-sample forecast record, and, therefore, it was used in Table III-5.

It should be stressed that the mechanical forecasts reported in Chapter III are not necessarily "optimal" as is usually understood in the literature on time-series analysis. 3/ Rather, they are merely intended to provide an indicator of the extent to which all economic forecasters might have been surprised by events unfolding in a given period. That the mechanical forecasters made large overestimates of budget year GNP in 1982 and 1983 just as did the human forecasters suggests that, to some extent, the economy during this period was experiencing "shocks" that surprised all forecasters. Since no models or forecasters are perfectly accurate, this string of shocks is itself not surprising, though, of course, it remains unpredictable.

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3. For example, while it is not surprising that the average autoregressive forecast outperformed the single most accurate specification over time, the unweighted average of all the forecasts is not necessarily an optimal combination of these forecasts since it may not provide minimum mean-square-error predictions. This problem will be explored more fully in a future CBO staff working paper which will also provide details on the procedures and results summarized here.

## ESTIMATING THE UNCERTAINTY OF CBO'S GNP FORECAST FOR FISCAL YEAR 1988

To estimate the degree of uncertainty in the CBO winter forecast of GNP for fiscal year 1988 (as published in January 1987), the procedure for model selection based on the November 1986 NIPA data was expanded to include several ARIMA model specifications. 4/ The ARIMA models were estimated and their forecasting performance simulated over the previous decade in a manner identical to that used for the autoregressive models described earlier. The ARIMA specification chosen had the lowest out-of-sample root-mean-square-errors (RMSEs) for eight-quarter-ahead forecasts of all models (mechanical and ARIMA) examined over the 1976-1986 period. 5/

The ARIMA model selected was then simulated over the period that extends from the fourth quarter of 1986 to the third quarter of 1988. On each of 5,000 simulation rounds, a new series of equation residuals and a new set of equation coefficients were selected using a normal random number generator. On each round a forecast of GNP was made for fiscal year 1988. The results are summarized in Figure III-4 of Chapter III.

In constructing Figure III-4, the CBO forecast of January 1987 was superimposed on the distribution of simulated outcomes for fiscal year 1988, since it was only 0.3 standard deviations below the simulated mean. The distribution depicted in Figure III-4, moreover, was assumed to be normal for heuristic reasons, even though the design of the simulation experiment suggests some possible departures from normality. The experimental results did indicate, however, that skewness in the forecast distribution was small and, probably, statistically insignificant.

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4. Autoregressive, integrated, moving-average (ARIMA) models are developed in G.E.P. Box, and G.M. Jenkins, *Time Series Analysis: Forecasting and Control* (San Fransisco: Holden-Day, Inc., 1970). Automatic procedures for ARIMA models are much harder to develop and implement on economic data and were therefore not included in the mechanical forecasting procedures described earlier. The ARIMA model chosen for the prospective analysis, however, produced budget year GNP forecasts comparable in accuracy with the mean mechanical forecasts reported in Chapter III.

5. The ARIMA model was estimated on the first differences of the natural logarithm of GNP. The selected model included an autoregressive term at lag one and moving-average terms at lags of ten and eleven quarters. The moving-average terms are a bit odd for a seasonally adjusted series of this type. A "bootstrap" experiment was conducted to see if the improved forecast performance of the equation with these terms was robust. The experimental results suggested it was. The presence of these high-order moving average terms might be rationalized as manifestations of residual seasonality present in the components of nominal GNP.

## APPENDIX B

# ESTIMATES OF POTENTIAL OUTPUT

The Congressional Budget Office's medium-term projections of output are related to a projection of potential output--defined as the maximum level of output that is consistent with a constant rate of inflation. The projection of potential output depends in turn on an estimate of the nonaccelerating inflation rate of unemployment (NAIRU)--that is, the unemployment rate consistent with a stable inflation rate.

CBO has revised its estimate of NAIRU in the period from 1981 through 1992. The reestimate of NAIRU was motivated by the recent drop in the unemployment rate to a level close to the previously assumed level of NAIRU--a drop that did not seem to be accompanied by other signs of tightness in the economy (see Box I-2). A major argument for a lower estimate of NAIRU is the change in the demographic composition of the labor force.

Demographic changes matter because unemployment rates of groups within the labor force differ from one another. The aggregate unemployment rate can vary either as unemployment rates within such groups vary or as the relative proportions of such groups vary. CBO has calculated a series designed to isolate the effect that changes in the composition of the labor force would have on the aggregate unemployment rate if each group experienced its average unemployment rate. While changes in this series reflect demographic changes, its level has no particular meaning.

The civilian labor force was broken into 14 groups according to age and sex, and the average unemployment rate for each group over the 1948:I to 1987:I period was determined. 1/ The series was then calculated quarter-by-quarter by multiplying each group's average unemployment rate by its share of the labor force for that quarter, and summing the result over all groups. The series was then projected beyond the current period by using the Bureau of Labor Statistics' projections of labor force composition.

As Figure B-1 shows, this series, U*, drops about 0.3 percentage point from 1980 to 1986 and an additional 0.2 percentage point from 1986 to 1992.

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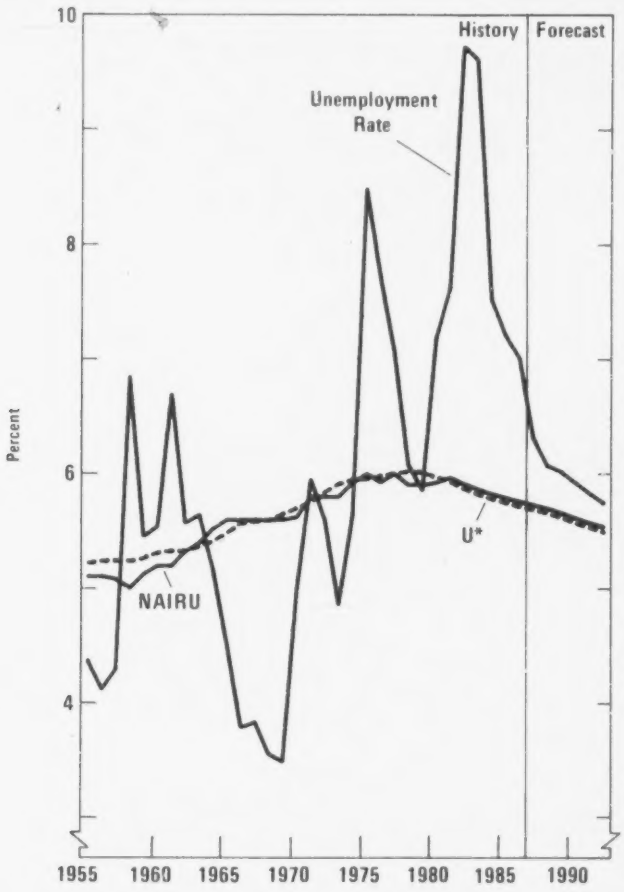
1. The age groups were: 16-19; 20-24; 25-34; 35-44; 45-54; 55-64; and 65 and older.

Figure B-1.
The Effect of Demographics on the Unemployment Rate



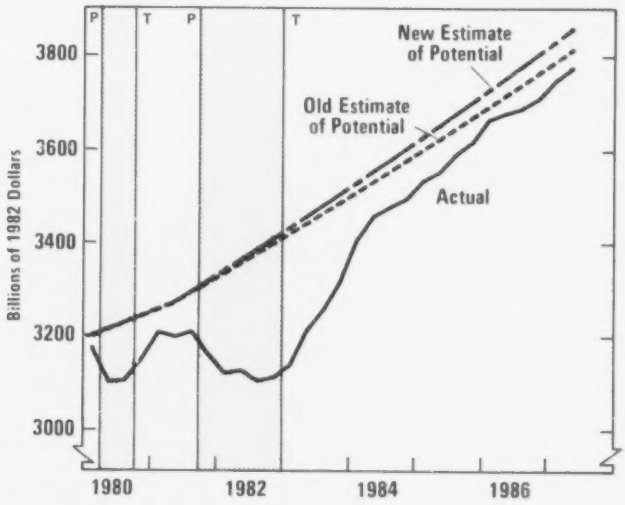

SOURCES: Congressional Budget Office; Department of Labor, Bureau of Labor Statistics; Robert J. Gordon, *"Inflation, Flexible Exchange Rates, and the Natural Rate of Unemployment,"* in Martin N. Baily, ed., *Workers, Jobs, and Inflation* (Washington, D.C.: The Brookings Institution, 1982) pp. 89-158.

NOTE: Changes in U* are an estimate of the effect of demographic changes on the unemployment rate. The construction of U* is explained in the text.

Most of these reductions are accounted for by declines in the shares of young workers in the labor force, especially teenagers.

Changes in U* were taken to indicate changes in NAIRU resulting from changing labor-force demographics. For instance, if U* dropped by 0.1 percentage point over a given period, NAIRU would also be assumed to drop by 0.1 percentage point over that period. Thus, rather than remaining at 6 percent after 1980 (as was previously assumed), NAIRU drops to about 5.7 percent by 1986 and 5.5 percent by 1992.

Figure B-2.
Real Gross Domestic Product




SOURCES: Congressional Budget Office; Department of Commerce, Bureau of Economic Analysis.

Once the estimate of NAIRU is established, potential real gross domestic product (GDP) can be estimated using the method described in CBO's January report. This method relates real GDP to the unemployment rate, NAIRU, and time trends representing peak-to-peak periods of the business cycle. The results, shown in Figure B-2, indicate that the new estimate is slightly higher than the January estimate. 2/ The gap between actual and potential real GDP in 1987:I is 2.2 percent of potential on the basis of the current series, whereas it would have been 2.0 percent on the basis of the old series and data available in January. On average, the historical gap based on the new potential series is 0.5 percent.

The estimates indicate that since the most recent business-cycle peak in 1981:III, the trend rate of growth of potential GDP has been 2.73 percent per year, while that of the potential labor force has been 1.58 percent per year. Thus, the most recent evidence indicates potential GDP is growing more rapidly than the potential labor force by 1.15 percentage points.

The projected growth of potential GDP, is assumed to continue to outpace that of the potential labor force by 1.15 percentage points. In turn,

2. The increase in the estimate of potential is the result of both the change in the estimate of NAIRU and the Commerce Department's upward revision in July of historical GNP data.

the potential labor force is assumed to grow at 1.3 percent per year through 1992--equal to the 1986 through 1992 annual average labor force growth rate projected on the most recent BLS moderate growth path. Together, these assumptions imply that potential GDP will grow at approximately 2.45 percent per year through 1992. The projected potential GNP is constructed from potential GDP by adding projected net factor service flows.

APPENDIX C

# HISTORICAL ESTIMATES OF THE STANDARDIZED-EMPLOYMENT DEFICIT

TABLE C-1. HISTORICAL ESTIMATES OF POTENTIAL GNP, NAIRU, AND THE STANDARDIZED-EMPLOYMENT DEFICIT

| Years | Potential GNP (In Billions of Dollars) | NAIRU a/ | Standardized-Employment Deficit (-) | |
|---|---|---|---|---|
| | | | In Billions of Dollars | As Percent of Potential GNP |
| 1956 | 408 | 5.1 | 2 | 0.6 |
| 1957 | 435 | 5.1 | 3 | 0.6 |
| 1958 | 459 | 5.0 | 2 | 0.4 |
| 1959 | 484 | 5.1 | -9 | -1.9 |
| 1960 | 511 | 5.2 | 3 | 0.6 |
| 1961 | 535 | 5.2 | 4 | 0.7 |
| 1962 | 565 | 5.3 | -3 | -0.5 |
| 1963 | 597 | 5.4 | -1 | -0.1 |
| 1964 | 628 | 5.4 | -5 | -0.8 |
| 1965 | 665 | 5.6 | -3 | -0.4 |
| 1966 | 709 | 5.6 | -11 | -1.6 |
| 1967 | 760 | 5.6 | -17 | -2.3 |
| 1968 | 816 | 5.6 | -35 | -4.3 |
| 1969 | 892 | 5.6 | -8 | -0.9 |
| 1970 | 977 | 5.6 | -7 | -0.7 |
| 1971 | 1,061 | 5.7 | -20 | -1.9 |
| 1972 | 1,155 | 5.8 | -20 | -1.7 |
| 1973 | 1,253 | 5.8 | -22 | -1.7 |
| 1974 | 1,399 | 5.8 | -11 | -0.8 |
| 1975 | 1,585 | 6.0 | -33 | -2.1 |
| 1976 | 1,771 | 5.9 | -46 | -2.6 |
| 1977 | 1,976 | 6.0 | -34 | -1.7 |
| 1978 | 2,179 | 5.9 | -53 | -2.4 |
| 1979 | 2,448 | 5.9 | -40 | -1.6 |
| 1980 | 2,734 | 5.9 | -51 | -1.9 |
| 1981 | 3,057 | 6.0 | -48 | -1.6 |
| 1982 | 3,364 | 5.9 | -51 | -1.5 |
| 1983 | 3,595 | 5.9 | -106 | -3.0 |
| 1984 | 3,831 | 5.8 | -130 | -3.4 |
| 1985 | 4,054 | 5.8 | -171 | -4.2 |
| 1986 | 4,278 | 5.8 | -185 | -4.3 |

SOURCES: Congressional Budget Office; Robert J. Gordon, *Macroeconomics* (New York: Little, Brown, 1984), Appendix B, Table B-2, Column 6.

a. The NAIRU (nonaccelerating inflation rate of unemployment) was referred to in some previous CBO publications as the stable inflation rate of unemployment.

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